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# Bulletin of the

# ENTOMOLOGICAL SOCIETY OF AMERICA

*Published by the*

ENTOMOLOGICAL SOCIETY OF AMERICA

Formed in 1953 by Consolidation of the
American Association of Economic Entomologists
(1889-1952)
and the former
Entomological Society of America (1906-1952)

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**BULLETIN**
**of the**
**ENTOMOLOGICAL SOCIETY OF AMERICA**

**Published by**
**ENTOMOLOGICAL SOCIETY OF AMERICA**

**R. H. Nelson, Editor**
**1530 P Street, N.W., Washington 5, D. C.**
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## SUSTAINING ASSOCIATES

Renewals from two of our Sustaining Associates were received after the March BULLETIN went to press. We are pleased to note these additions to the list published in that issue.

American Cyanamid Company, Phosphates and Nitrogen Division, Insecticide Department, 30 Rockefeller Plaza, New York 3, New York. 1956-57.

General Chemicals Division, Allied Chemical and Dye Corporation, 40 Rector Street, New York 6, New York. 1955-56-57.

A change in the name of one of our Sustaining Associates previously listed as Carbide and Carbon Chemicals Company was recently announced. The new name is as follows:

Union Carbide Chemicals Company
30 East 42nd Street
New York 17, New York 1955-56-57.

The attention of all BULLETIN readers is directed to the listings of our Sustaining Associates as published on the inside back cover of the April, 1957 JOURNAL OF ECONOMIC ENTOMOLOGY and the May 1957 ANNALS OF THE ENTOMOLOGICAL SOCIETY OF AMERICA. In addition, a complete listing will be printed in the program of the Annual Meeting which will appear in the September issue of the BULLETIN.

Elsewhere in this issue will be found a list of 1957 Special Committees. It will be noted that there is a *Sustaining Associates Committee* on the Governing Board which coordinates the work of the *Sustaining Associates Committees* in the Branches, the chairmen of which constitute a Special Committee. Suggestions and comments of members of the Society in regard to the Sustaining Associate program should be directed to these committees.

## EXHIBITS AT MEMPHIS

Commercial exhibits will be accepted for the Memphis meeting of the Entomological Society of America, December 2-5, 1957. Representatives of interested firms should write Mr. H. B. Jones, Chairman, Exhibits Committee, 2772 Natchez Lane, Memphis, Tennessee, for rates and information.

## AUTOGRAPHA O O

ANNUAL MEETING. The attention of all members is directed to *Program Highlights* on Page 1. Please note that the deadline date for receipt of titles and abstracts is September 1. The 1957 meeting in Memphis will be the Fifth Annual Meeting of the Society, counting from the date of amalgamation. However, as an interested member Dr. R. H. Davidson has pointed out, this makes our professional society sound like an infant. This year's meeting will, in fact, be the 69th anniversary of the former *American Association of Economic Entomologists* and the 52nd anniversary of the former *Entomological Society of America*.

BRANCH MEETINGS. The editor, in his alter ego as Executive Secretary, has attended the 1957 meetings of the Cotton States, Southwestern and North Central Branches. And we will be at the Pacific Branch meeting at Portland, Oregon on June 26-28, about the time this issue of the BULLETIN is received. The Society now has more than 4000 members. By attendance at the Branch meetings, we are increasing our association of names and faces and, we hope, helping the development of the Society.

SOCIETY COMMITTEES. The Standing Committees of the Society were published in the March issue of the BULLETIN, while the Special Committees as selected by President Armitage will be found elsewhere in this issue. Members may send apropos comments to the committee concerned. Your attention is called to the articles in this issue by President Armitage in regard to resolutions to be presented at the Memphis Meeting and to the revision of the Constitution.

PUBLICATIONS. Copy for INDEX XV TO THE LITERATURE OF AMERICAN ECONOMIC ENTOMOLOGY covering the literature for 1955 has gone to the printer; Dr. Fisher has stated the ENTOMA 12 will be out this summer; the ANNUAL REVIEW OF ENTOMOLOGY, Volume 3, is in the mill and will be out in February 1958. Order blanks for these publications will be sent to all members.

## MILESTONE FOR W. A. PRICE

On about July 1, 1957, W. A. Price, head of the Department of Entomology, at the University of Kentucky, will be given a "change-of-work" status. Mr. Price came to the University of Kentucky in 1929 as State Entomologist, professor of entomology and head of the Department. He joined the former Entomological Society of American in 1916 and the former American Association of Economic Entomologists in 1920. On five occasions he served as a vice-president of the latter organization. He has our best wishes in his retirement.

## T. H. PARKS HONORED

On June 7, 1957, the Ohio State University conferred the degree of D. Sc. on T. H. Parks, Emeritus Professor of Entomology at Ohio State, where he served from 1918 to 1956. Other accomplishments of note that may be mentioned are, first extension entomologist in the United States (Idaho, 1913) and "Mr. Extension" to more than a generation of entomologists and fellow extension workers; recipient in 1951 of the Superior Service Award of the U. S. Department of Agriculture; forty-four year member of this Society. We are pleased to address him as Dr. Parks and herewith extend congratulations and best wishes. Felicitations will reach him at 1501 Doone Road, Columbus 21, Ohio.

## PROGRAM HIGHLIGHTS

### 5th Annual Meeting Entomological Society of America

### *Hotel Peabody, Memphis, Tennessee – December 2, 3, 4 and 5, 1957*

The basic outline for the program of the Fifth Annual Meeting of the Society has been established and will conform to the pattern of past meetings. All paper reading sessions will be timed and scheduled. The general program will include an address by President H. M. Armitage on *Man In An Insect World* and by M. R. Clarkson, Deputy Administrator, Regulatory Programs, U. S. Department of Agriculture, on some interesting aspects of control programs. Another feature of the general program is a symposium on insect behavior which is being organized by K. D. Roeder. An innovation this year will be an invitational paper in a field related to, but distinct from, entomology. Specifically, H. A. Borthwick will speak on the effect of light on plants.

Arrangements for a number of excellent invitational papers and symposia are being made by the various sections. A symposium on the comparative physiology of drugs and insecticides is planned by Section B, and J. B. Kitzmiller will review his work on mosquito genetics at the invitation of Section D.

Although not part of the formal program, another feature of the Memphis meeting will be an opportunity to observe the governing board at work.

Exhibits depicting new techniques associated with various aspects of entomology have become an important part of the annual meetings. Ample space, therefore, has been provided in the Hotel Peabody. Members who have appropriate material to display are urged to get in touch with Mr. H. B. Jones, Chairman Exhibits Committee, 2772 Natchez Lane, Memphis, Tennessee, concerning their requirements.

Since the Cotton States Branch is meeting in Memphis in conjunction with the parent Society, the number of submitted papers is expected to be large. Be sure to send titles and abstracts to E. N. Woodbury, Hercules Powder Company, Research Center, Wilmington, Delaware, *before the September 1 deadline.*

#### IN BRIEF

The Fifth Annual Meeting of the Entomological Society of America will be held in conjunction with the Cotton States Branch at the Hotel Peabody, Memphis, Tennessee, December 2 through 5, 1957. The chairman of the Local Arrangements Committee is Dr. H. G. Johnston, National Cotton Council of America, Post Office Box 9905, Memphis 12, Tennessee.

The program will be published in the September issue of the BULLETIN. Additional free copies will also be available at the meeting.

*The deadline for receipt of titles and abstracts for the Memphis meeting is September 1, 1957. Send these to E. N. Woodbury, Chairman, Program Committee, Hercules Powder Company, Research Center, Wilmington, Delaware.*

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## IMPORTANT NOTICE TO AUTHORS

Beginning September 1, 1957, each manuscript submitted for publication in the ANNALS OF THE ENTOMOLOGICAL SOCIETY OF AMERICA or in the JOURNAL OF ECONOMIC ENTOMOLOGY must be accompanied by an abstract suitable for publication, and prepared in accordance with instructions for the preparation of abstracts as required by *Biological Abstracts.* This abstract will replace the usual author's summary. The editors who review and decide on the acceptability of the paper will also review the abstract critically and, in case the article is acceptable, will require any revision of the abstract that may be necessary. Each abstract should be typewritten (double spaced) on a separate sheet (or sheets) of paper. It should be an informative digest of the significant content and conclusions of the paper, not a mere description. It should be intelligible in itself, without reference to the original, but is not intended to substitute for it. It should be brief (preferable less than 3% of the original) written in whole sentences, not telegraphic phrases.

Abstracts (except those of Scientific Notes in the JOURNAL OF ECONOMIC ENTOMOLOGY) will be published at the head of their respective manuscripts and a copy of the page proof of the first page of each paper, containing the abstract with citation added, will be sent to *Biological Astracts.* The abstract may thus appear in *Biological Abstracts* simultaneously with the article itself in its respective journal.

The requirement, as outlined above, is in accordance with recent action taken by the respective Editorial Boards and has the approval of the Editors, and of the Executive Committee of the Governing Board of the Entomological Society of America. Several biological journals have already adopted the plan. With widespread adoption of this plan by biological journals, the form in which the abstracts are printed in the various journals could be made uniform so that, instead of copying the abstracts in their format, *Biological Abstracts* could simply clip, arrange and paste them in galley form for direct photo offset reproduction, thereby effecting a great saving of editorial time and publication costs.

We trust that our membership will approve of this change as a forward step, and cooperate wholeheartedly with other biological disciplines in its adoption. A copy of a guide for the preparation of abstracts may be obtained from *Biological Abstracts* or from the office of the Executive Secretary, 1530 P Street, Washington 5, D. C.

H. M. ARMITAGE,
*President,*
*Entomological Society of America*

## SUBMISSION OF RESOLUTIONS

The following *Resolution Committee* is being announced early in the administrative year to permit the preferred manner of handling the submission of resolutions for consideration by the membership at the Memphis meeting, December 2-5, 1957.

C. E. Mickel, Univ. of Minnesota, St. Paul, Minnesota

Neely Turner, Agricultural Experiment Station, New Haven, Connecticut

P. O. Ritcher, Oregon State College, Corvallis, Oregon

A. H. Yeomans, USDA, Washington, D. C.

Milton D. Farrar, *Chairman*, Clemson College, Clemson, South Carolina

To many, such a committee is a small group of individuals set up in an organization for the purpose of writing resolutions commending and thanking all those concerned with the success of any official meeting or available to members at such meetings to hastily write up any resolution that might be suggested to them by title at the last minute.

It is true that the first item is one of the responsibilities of such a committee, also that on occasion they can be helpful in the second. However, the latter use should be avoided if at all possible. Committee members are admittedly fully capable of analyzing the thinking expressed in a resolution, but should not be expected to furnish the thinking in putting someone else's ideas into writing on the spur of the moment.

The true functions of a *Resolutions Committee* should be more far reaching than any of these outlines. Primarily they should provide a means of reviewing submitted resolutions and making sound recommendations as to their disposition.

To be of any real value, a resolution should be very carefully thought out and worded by the person or persons concerned with its presentation. Then, and only then, should it be submitted to the committee for careful study and consideration of any policy implications before being presented by the committee, with its recommendations, to the Governing Board or to the membership for approval, whichever the subject might require.

Often it is greatly to be desired that a resolution involving policy matters be presented in time so that it can be given full publicity in the BULLETIN, prior to an annual meeting, so that the members present at the business session at which it is presented will be able to vote on it intelligently and not give approval or disapproval based on hasty judgment.

Though members have the inherent right to present resolutions from the floor at any regular business session, experience has shown such action is sometimes unwise and the result often adverse to the best interests of the organization concerned.

The cooperation of all members is therefore solicited to the extent that any contemplated resolution be anticipated as much as possible and presented in writing to the Chairman of the *Resolutions Committee* well in advance of the next annual meeting of the Society so that the suggested procedure can be closely followed.

H. M. Armitage
*President*

**NOTICE**

Please read **Program Highlights** on page 1.

## SPECIAL COMMITTEES

The membership of the Society's Standing Committees and the list of Society Representatives were presented on pages 22 and 23 of the March 1957 BULLETIN. President Armitage has appointed the following Special Committees and Special Representatives for 1957. Relevant comments should be sent to the appropriate committees.

**Local Arrangements—Memphis Meeting**

A. G. Bennett, State College, Mississippi
C. M. Crutchfield, Memphis, Tennessee
S. L. Calhoun, Leland, Mississippi
D. C. Drake, Memphis, Tennessee
H. B. Jones, Memphis, Tennessee
Louis Kotler, Memphis, Tennessee
M. E. Merkl, Leland, Mississippi
L. C. Murphree, State College Mississippi
R. P. Mullett, Knoxville, Tennessee
C. A. Paulson, Memphis, Tennessee
C. L. Ritchie, Memphis, Tennessee
M. W. Smith, Memphis, Tennessee
W. W. Stanley, Knoxville, Tennessee
H. G. Johnston, *Chairman*, Memphis, Tennessee

**Ladies' Entertainment—Memphis Meeting**

Wives of members of Local Arrangements Committee
Mrs. H. G. Johnston, *Chairman*, Memphis, Tenn.

**Exhibits—Memphis Meeting**

C. B. Philip, Hamilton, Montana
D. L. Collins, Albany, New York
D. M. DeLong, Columbus, Ohio
G. G. Rohwer, Macon, Georgia
H. B. Jones, *Chairman*, Memphis, Tennessee

**Resolutions—Memphis Meeting**

(See President Armitage's article, *Submission of Resolutions*, elsewhere in this issue of the BULLETIN)

C. E. Mickel, St. Paul, Minnesota
Neely Turner, New Haven, Connecticut
Paul O. Ritcher, Corvallis, Oregon
A. H. Yeomans, Washington, D. C.
Milton D. Farrar, *Chairman*, Clemson, S. C.

**Public Relations**

Paul A. Dahm, Ames, Iowa
D. G. Hall, Washington, D. C.
George Knowlton, Logan, Utah
L. C. Murphree, State College, Mississippi
George C. Decker, *Chairman*, Urbana, Illinois

**Welfare of Entomology**

J. R. Douglass, Twin Falls, Idaho
George T. York, Ankeny, Iowa
D. R. Johnson, Falls Church, Virginia
R. H. Nagel, Fort Collins, Colorado
Roy E. Campbell, *Chairman*, Whittier, California

**Constitution**

(Members of the Society are asked to read the proposed revised and amended Constitution of the Society as printed in the March 1957 BULLETIN. Comments should be sent to the Committee.)

William E. Stone, Mexico City, Mexico
Daniel Ludwig, New York, New York
John T. Creighton, *Chairman*, Gainesville, Fla.

**Affiliation, American Institute of Biological Sciences (AIBS)**

C. E. Palm, Ithaca, New York
Ray Hutson, East Lansing, Michigan
Gordon E. Ferris, Palo Alto, California
Frank L. Campbell, Washington, D. C.
Robert Glen, *Chairman*, Ottawa, Ontario, Can.

**Hazardous Materials**

James N. Roney, Phoenix, Arizona
A. C. Gunter, Dallas, Texas
J. G. Watts, *Chairman*, State College, New Mex.

**Revision of Brochure No. I**

C. F. Stiels, Stillwater, Oklahoma
R. W. Every, Corvallis, Oregon
Lawrence A. Carruth, *Chairman*, Tucson, Ariz.

**Index to the Literature of American Economic Entomology**

B. A. Porter, Beltsville, Maryland
Mrs. Helene Cushman, Washington, D. C.
C. F. W. Muesebeck, *Chairman*, Wash., D. C.

**Sustaining Associates**

Governing Board Committee:

J. W. Apple, Madison, Wisconsin
Ed. H. Littooy, San Francisco, California
C. M. Meadows, *Chairman*, Waco, Texas

Branch Committee Chairmen:

L. C. Kuitert, Cotton States Branch
Leo G. K. Iverson, North Central Branch
C. C. Cassill, Pacific Branch
E. W. Laake, Southwestern Branch
W. E. McCauley, *Chairman*, Eastern Branch

**Memorial Lectures**

(Appointed by President Porter and continued in 1957)

E. G. Linsley, Berkeley, California
C. C. Compton, Bronxville, New York
C. K. Dorsey, Morgantown, West Virginia
C. B. Philip, Hamilton, Montana
W. P. Hayes, *Chairman*, Urbana, Illinois

**Society Membership Insignia**

L. F. Curl, Washington, D. C.
R. A. Fulton, Beltsville, Maryland
L. G. Davis, *Chairman*, Washington, D. C.

**Losses Caused by Insects**

(This committee is incomplete at the present writing)

H. M. Harris, *Chairman*, Ames, Iowa

### SPECIAL REPRESENTATIVES

C. F. Smith, Raleigh, North Carolina to the inauguration of W. C. Friday as President of the Consolidated University of North Carolina. At Raleigh, May 8, 1957.

N. E. Good, Philadelphia, Pennsylvania, to the Centennial Convention, National Education Association. At Philadelphia, July 3, 1957.

## BRANCH OFFICERS

The list of current Branch Officers was printed on the inside back cover of the March 1957 BULLETIN. Since then the North Central Branch has met and their new officers are as follows:

D. A. Wilbur, *Chairman*, Manhattan, Kansas, R. E. Hill, *Chairman-Elect*, Lincoln, Nebraska, C. W. Wingo, *Secretary-Treasurer*, Columbia, Missouri.

## MEETINGS

PORTLAND, OREGON. Multnomah Hotel. June 26-28, 1957. Forty-First Annual Meeting, Pacific Branch, Entomological Society of America. H. H. Keifer, Secretary-Treasurer, 1112 Swanston Drive, Sacramento, California.

CENTENNIAL, WYOMING. University of Wyoming Science Summer Camp. August 11-15, 1957. Twenty-Eighth Annual Rocky Mountain Conference of Entomologists. G. T. Mickel, Secretary, Colorado State University, Fort Collins, Colorado.

STANFORD, CALIFORNIA. Stanford University, August 25-29, 1957. The Eighth Annual Meeting of the American Institute of Biological Sciences. Hiden T. Cox, Executive Director, AIBS, 2000 P Street, N.W., Washington 6, D. C.

DUBLIN, IRELAND. September 4-11, 1957. The One-Hundred Nineteenth Annual Meeting, British Association for the Advancement of Science. The Secretary, British Association, Burlington House, London, W.1., England.

HAMBURG, GERMANY. September 8-15. IVth International Congress of Crop Protection. Dr. Harold Richter, President, Biologishe Bundesanstalt fur Land-und Forstwirtschaft, Messeweg 11-12, Braunschweig, Germany.

LOUISVILLE, KENTUCKY. October 21-24, 1957. The 1957 Annual Convention of the National Pest Control Association. Ralph E. Heal, Executive Secretary, Buettner Memorial Building, 250 West Jersey Street, Elizabeth, New Jersey.

LETHBRIDGE, ALBERTA, CANADA. Marquis Hotel. October 29-31, 1957. The Seventh Annual Meeting of the Entomological Society of Canada and the Fifth Annual Meeting of the Entomological Society of Alberta. D. S. Smith, Secretary, Science Service Laboratory, Crop Insect Section, Box 270, Lethbridge, Alberta, Canada.

NEW YORK, NEW YORK. Commodore Hotel. November 25-26, 1957. The Twenty-Ninth Annual Meeting, Eastern Branch, Entomological Society of America. B. F. Driggers, Secretary-Treasurer, New Jersey Agricultural Experiment Station, New Brunswick, New Jersey.

BANGKOK, THAILAND. Chulalongkorn University, November 18—December 9, 1957. Ninth Pacific Science Congress of the Pacific Science Association, Office of the Secretary-General of the Congress, Department of Science, Ministry of Industry, Bangkok, Thailand.

MEMPHIS, TENNESSEE. Hotel Peabody. December 2-5, 1957. The Fifth Annual Meeting of the Entomological Society of America. H. M. Armitage, President, 1617 41st Street, Sacramento 19, California. H. G. Johnston, Chairman, Local Arrangements Committee, National Cotton Council, Memphis, Tennessee. E. N. Woodbury, Chairman, Program Committee, Hercules Powder Company, Research Center, Wilmington, Delaware. R. H. Nelson, Executive Secretary, 1530 P Street, N.W., Washington 5, D. C.

MEMPHIS, TENNESSEE. Hotel Peabody. December 2-5, 1957. The Thirty-Second Annual Meeting, Cotton States Branch, Entomological Society of America. In conjunction with the parent Society (See above). M. E. Merkl, Secretary-Treasurer, Box 202, Leland, Mississippi.

HOLLYWOOD, FLORIDA. Hollywood Beach Hotel, December 9-12, 1957. The Forty-Fourth Annual Meeting of the Chemical Specialties Manufacturers Association, Inc. H. W. Hamilton, Secretary, C.S.M.A., 50 East 41st Street, New York 17, New York.

INDIANAPOLIS, INDIANA. December 26-31, 1957. The One-Hundred Twenty-Fourth Meeting of the American Association for the Advancement of Science. Dael Wolfle, Executive Officer, AAAS, 1515 Massachusetts Avenue, N.W., Washington 5, D. C.

## REPORT OF THE AAAS COUNCIL MEETING

### *December 27-30, 1956, New York City*

### ITEMS OF BUSINESS OF INTEREST TO THE ESA

1. A plan has been devised and agreed upon to merge the two journals, SCIENCE and SCIENTIFIC MONTHLY. A better single journal is envisaged which will ultimately be of greater interest to both advertisers and readers. A few problems still remain to be solved but it is hoped that the merger will go into effect some time after January 1958.

2. The AAAS building was completed in 1956 and is now occupied.

3. The Chairman of Section F, to which entomology belongs, for 1957 is Dr. E. Raymond Hall, University Museum, University of Kansas, Lawrence, Kansas.

4. The AAAS has changed the names of some of its member categories and all scientific organizations previously classed as "Associates" are now called "Affiliates." The Entomological Society of America is one of these organizations.

5. Circulated earlier in the year was a proposal to assess affiliates $25 per year per council member in order to contribute to the traveling expenses of those attending council meetings. This proposal met heavy opposition (not from ESA) and was dropped.

6. The most important item of business concerned the report of the *Committee on the Social Aspects of Science*. The subject under discussion was essentially that we are living in a technological world increasingly dependent on and influenced by the products of science; under these conditions should not scientists assume a more responsible position in regard to the use of scientific knowledge. This has been a hot subject of general interest and perhaps ultimately of the greatest importance to scientists and has received some notice in the press. I would urge that you read in SCIENCE for January 25, 1957, the two articles on this subject which appear on pages 141 and 143. The latter is a fairly long article which gives an excellent resume of the entire situation and some of its problems. I would further recommend that attention be called to this article in our BULLETIN so that interested entomologists will have some idea of one of the major issues facing all scientists.

No definite action was taken other than continuing the Committee with instructions to study the problem further and try to come up with some practical suggestions for scientists to follow.

7. The *Resolutions Committee* submitted two resolutions, one concerning the preservation of freedom of research and teaching in the sciences and the other suggesting that the *United States National Committee for the International Geophysical Year* take a broader view on the participation of biologists in the activities of their committee.

Respectfully submitted,

H. H. Ross
*Councilor for ESA—1956.*

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## Annals of the Entomological Society of America

We are pleased to bring to the attention of all our members what the ANNALS readers already know, that is, the ANNALS is completely up to date in appearance of issues. The May 1957 number went in the mail on May 15. This is a goal achieved toward which we have long been working. We wish to herewith extend public thanks to Mr. F. L. Hayman, President of the Spahr and Glenn Company, of Columbus, Ohio, where the ANNALS is printed—and has been since Volume 1, Number 1 in 1908. Parenthetically, this company is celebrating its 100th year in printing.

Dr. M. T. James, *Editor;* Dr. R. F. Hussey, *Associate Editor;* the ANNALS *Editorial Board;* Dr. F. W. Poos, *Editorial Assistant* and others also deserve commendation.

Editor James has informed us that by the end of the year the time between receipt and publication of ANNALS papers will be within the schedule now maintained for the JOURNAL OF ECONOMIC ENTOMOLOGY. This is his tenth year as Editor. Since he has asked to be relieved at the end of the year, it is also his last. More will be written on this later. In the meantime, he should "take a bow" on behalf of the up-to-date ANNALS.

## GOVERNING BOARD

P. J. Reno, Representative of the Southwestern Branch on the Governing Board resigned because of moving out of the Branch area. At the Southwestern Branch meeting in San Antonio, Texas, on March 10-12, 1957, C. M. Meadows, Waco, Texas, was elected to this office. The list of members of the Governing Board as given on page 22 of the March 1957 BULLETIN should be corrected accordingly.

## NECROLOGY

BOVING, ADAM G. 87. Retired entomologist, U. S. Department of Agriculture. Honorary Member, Entomological Society of America. At his home in Washington, D. C., March 16, 1957.

CUSHMAN, R. A. 77. Retired entomologist, U. S. Department of Agriculture, in Altadena, California, March 28, 1957.

FORD, L. W. 38. Entomologist, President of Oasis Chemical Company, El Centro, California. In an airplane accident in Oklahoma, February 18, 1957.

HAWES, INA L. 60. Librarian, U. S. Department of Agriculture. Compiler of Volumes 7 through 15, INDEX TO THE LITERATURE OF AMERICAN ECONOMIC ENTOMOLOGY. At Garfield Memorial Hospital, Washington, D. C., March 23, 1957.

LOUNSBURY, C. P. 82. Retired entomologist, Union of South Africa Department of Agriculture. At his home in Pretoria, South Africa, June 7, 1955.

SANDERS, J. G. 76. Retired entomologist, first state entomologist of Wisconsin, Past-President, American Association of Economic Entomologists, Emeritus Member, Entomological Society of America. At Lee Memorial Hospital, Fort Myers, Florida, March 13, 1957.

## RECENT APPOINTMENTS

Dr. J. M. Grayson, Head, Entomology Section, Virginia Agricultural Experiment Station, Blacksburg, Virginia, announces the appointment of Dr. G. M. Boush to the Tidewater Research Station, Holland, Virginia, and of Dr. D. G. Cochran to a new position in insect physiology at the Virginia Polytechnic Institute at Blacksburg. These Society members are herewith congratulated.

## HONORARY MEMBERS

The Society has 10 Honorary Members. We have listed them below, along with addresses and birth dates. The contributions of these men to the biological sciences in general and to entomology in particular are part of our heritage. Their Honorary status indicates the high esteem of all entomologists and the appreciation of the Society. Associates and former students may wish to occasionally "drop a line," such as a birthday card, to these, our honored seniors.

P. P. Calvert, P.O. Box 14, Cheyney, Pennsylvania, January 29, 1871

E. N. Cory, University of Maryland, U.S.O.M., Georgetown, British Guiana, S.A., August 13, 1886

A. M. da Costa Lima, Instituto Oswaldo Cruz, Cx. Postal 926, Rio de Janeiro, Brazil, June 29, 1887

J. J. Davis, Department of Entomology, Purdue University, Lafayette, Indiana, October 9, 1885

O. A. Johannsen, Box 48, College of Agriculture, Ithaca, New York, May 14, 1870

J. G. Needham, 6 Needham Place, Ithaca, New York, March 18, 1868

W. A. Riley, Department of Zoology, University of Minnesota, Minneapolis, Minn., January 10, 1876

V. E. Shelford, Vivarium Building, Wright & Healey Sts., Champaign, Illinois, September 22, 1877

R. E. Snodgrass, Division of Insects, U. S. National Museum, Washington 25, D. C., July 5, 1875

E. M. Walker, Royal Ontario Museum of Zoology and Palaeontology, 100 Queen's Park, Toronto 5, Ontario, Canada, October 5, 1877

## ZOOLOGICAL NOMENCLATURE

**Notice of proposed use of the Plenary Powers in certain cases for the avoidance of confusion and the validation of current nomenclatorial practice. (A.(n.s.)33)**

Notice is hereby given that the possible use by the International Commission on Zoological Nomenclature of its Plenary Powers is involved in an application relating to the under-mentioned names included in Double-Part 2/3 and Part 4 of Volume 13 of the *Bulletin of Zoological Nomenclature* which will be published on 29th March 1957.

(a) *Applications in Double-Part 2/3 of Volume 13*

(4) *Dictyoploca*, Jordan, 1911, validation of (Class Insecta, Order Lepidoptera) (Z.N.) 1072);

(5) *Staphylinus* Linnaeus, 1758, designation of *Staphylinus erythropterus* (emend. of *erytropterus*) Linnaeus, 1758, as type species of (Class Insecta, Order Coleoptera) (Z.N.(S.)242);

(6) *Anopheles* Meigen, 1818, designation of a type species for, in harmony with accustomed usage (Class Insecta, Order Diptera) (Z.N.(S.)1165);

(9) *Toxorhynchites* Theobald, July 1901, validation of (Class Insecta, Order Diptera) (Z.N.(S) 1166);

2. The present Notice is given in pursuance of the decisions taken on the recommendation of the International Commission on Zoological Nomenclature, by the Thirteenth International Congress of Zoology, Paris, July 1948 (see *Bull. Zool. Nomencl.* 4:51-56, ibid. 5:5-13, 131).

3. Any specialist who may desire to comment on any of the foregoing applications is invited to do so in writing to the Secretary to the Internation Committee (Address: 28 Park Village East, Regent's Park, London N.W. 1., England) as soon as possible. Every such comment should be clearly marked with the Commission's File Number as given in the present Notice, and sent *in duplicate*.

4. If received in sufficient time before the commencement by the International Commission of voting on the application in question, comments received in response to the present Notice will be published in the *Bulletin of Zoological Nomenclature;* comments received too late to be so published will be brought to the attention of the International Commission at the time of the commencement of voting on the application in question.

5. Under the decision by the International Congress of Zoology specified in paragraph 2 above, the period within which comments on the applications covered by the present Notice are receivable is a period of six calendar months calculated from the date of publication of the relevant Part of the *Bulletin of Zoological Nomenclature*. The Parts now in question will be published on 29th March, 1957. In consequence any comments on the applications published in this Part should reach the Secretariat of the International Commission at the latest by 29th September, 1957.

Francis Hemming
*Secretary to the International Commission on Zoological Nomenclature*

March, 1957

**Notice of proposed use of the Plenary Powers in certain cases for the avoidance of confusion and the validation of current nomenclatorial practice (A. (n.s.)36).**

Notice is hereby given that the possible use by the International Commission on Zoological Nomenclature of its Plenary Powers is involved in an application relating to the under-mentioned name included in Part 5 of Volume 13 of the *Bulletin of Zoological Nomenclature*, which will be published on 6th May, 1957.

(3) *Mansonia* Blanchard, 1901, validation of (Class Insecta, Order Diptera) (Z.N.(S) 1193).

2. As above.

3. As above.

4. As above.

5. As above except as follows. The Part now in question will be published on 6th May, 1957. In consequence any comments on the applications published in this Part should reach the Secretariat of the International Commission at the latest by 6th November, 1957.

Francis Hemming
*Secretary to the International Commission on Zoological Nomenclature*

2nd May, 1957.

## A. G. GRADY ADVANCED

Sinclair Chemicals, Inc., announced on May 7, 1957, the appointment of A. G. Grady as National Accounts Representative of the Nitrogen Products Division of Sinclair Chemicals. His headquarters will be in Chicago.

Mr. Grady of the Peet-Grady Test Method fame is a well-known member of this Society. We wish to take this means of extending congratulations and best wishes. The Editor is proud to have once been counted as one of Tony Grady's "boys."

## INSECT FACTS

The following is reprinted from MEMBER'S NEWSLETTER Number 1 of May, 1954:

"The *Centennial Commemoration Committee*, under the Chairmanship of David G. Hall, issued in March a printed publication of about 300 pages, entitled *Insect Facts*, which has been in preparation for several years. This attractive kit was designed for use by outlets such as newspapers, magazines, radio and TV, and not particularly for use by the profession. Its printing for this purpose was made possible by funds supplied by industry, arranged for entirely by the committee, and it was distributed to industry, to state leaders working with the Centennial Committee, and to the above publicity agencies. Reports indicate that the publication has been received very enthusiastically. Mr. Hall has kindly supplied the following additional information about the work:

"The 'Kit' contains chronological lists of the accomplishments and development in entomology in the United States since 1854, short articles on the more important insects, the more famous of the men who dealt with them, and the more fascinating entomological facts and factors that might interest news, magazine and radio writers. Anyone writing for the public, speaking to non-professional people, or teaching, will find this kit of extreme value to them in their future work. It also contains much data not published before. There is a list, for instance, of the important insects that came to this country from abroad in the past 100 years, where they came from, where and when they were first noted, and in many instances what they have done since they got here'."

Mr. Hall, for the *Centennial Commemoration Committee*, has given the Society the kits remaining on hand after the centennial celebration. We have some 100 of these and will supply them at $1.00 each, postpaid, to members of the Society, first come first served. The original price was $3.50 each. Please send your order to the Washington office.

## Dedication of the William O. Buettner Memorial Building

May 9, 1957 was an important day in the history of the National Pest Control Association for it was on that day that its new home in Elizabeth, New Jersey was dedicated. The occasion had a double significance, for it marked the first time that this Association has owned and operated its own headquarters, and it gave opportunity for the Association to dedicate this building to the memory and tradition of William Oscar Buettner, who before his untimely death in 1953 was recognized as the driving force behind the remarkable development of the pest control industry from questionable to semi-professional status. To be sure, there were certain entomologists, particularly Professor J. J. Davis, who had much to do with this development, but it seems unlikely that the willingness of entomologists to help could have been implemented without the dynamic energy of Bill Buettner, who is called by his own associates "architect of an industry."

The William O. Buettner Memorial Building is a converted residence located at 250 West Jersey Street, Elizabeth, New Jersey. It stands well back from the street surrounded by trees and azaleas. It is located not far from the center of town on a shaded street that is undergoing conversion from residential to professional use. It can be reached quickly from the Newark airport and is easily accessible by train and automobile. Parking facilities are provided in the back yard. It is a building that the Entomological Society of America would be proud to own and utilize as its national headquarters.

Certain guests, including past presidents and honorary members of the NPCA, were instructed to assemble at the Buettner Memorial Building at noon on May 9. They were taken to the Carteret Hotel for luncheon. At the same time the wives of the guests were taken to lunch. The dedication ceremonies took place in mid-afternoon behind the building. The speakers' platform was the back porch. The audience faced the porch on folding chairs under a marquee, which had been erected for the occasion. Appropriate flags and bunting decorated the speakers' platform. The day was bright, warm, and breezy—perfect for an outdoor ceremony. On the program nine speakers were listed. The ceremonies were opened by John K. Medoff, Chairman of the Dedication Committee. After the invocation, J. Edwin Sameth, President of NPCA, 1950-51 took over as Master of Ceremonies. A local newspaper publisher, Robert C. Crane, welcomed the Association to its new home. Dr. Lewis Webster Jones, President of Rutgers University, reminded the guests that progress is not inevitable and that work and effort must be continued if the Association is to go ahead. I. B. Carncross, President of NPCA, 1955-56 told the audience about the search for suitable property and how the building was selected. George R. Elliott, President of NPCA, 1943-44 laid the background for the unveiling of a plaque to the memory of Bill Buettner. This was done by Bill's widow, Helen. Finally, the current President of NPCA, Myron W. Smith, who was trained in entomology at The Ohio State University, talked on the future of the Association.

During the early part of these ceremonies most of the entomologists present were introduced to the audience as honorary members of the Association. Among those present were Fred C. Bishopp, Frank L. Campbell, John J. Davis, Lyman S. Henderson, E. F. Knipling, William E. McCauley, John V. Osmun, Charles E. Palm, Bailey B. Pepper, John B. Schmitt and T. E. Snyder.

Remaining in the background was entomologist Ralph E. Heal, Bill Buettner's successor, who had much to do with the move of the Association offices from rented quarters in New York City to its own home in Elizabeth and who is an important figure in the further development of the Association. Also, keeping himself inconspicuous was entomologist Philip J. Spear, the Technical Director of the Association.

Many past presidents of the Association were present. As this reporter is not able to name them all, he will not name any except those who took part in the ceremonies. It is obvious, however, that many people are very loyal to this Association and that it has great strength and vitality and will continue to go ahead toward professional status. Entomologists who know the National Pest Control Association offer best wishes for an ever-growing future in "the memory and tradition of William Oscar Buettner."

Frank L. Campbell

## ANNUAL MEETING

*Dates.* December 2-5, 1957. *Place.* Hotel Peabody, Memphis, Tennessee. See Page 1.

## PRESENT USE OF INSECTICIDES ON HIGHWAY AREAS

JOHN W. ZUKEL[1] and C. O. EDDY[2]

The National Highway Program, recently approved, represents the largest peace time construction program in history. The 41,000 mile network of interstate highways will be built on an average 300 foot right of way and will place over one million acres of land along the pavement subject to landscaping and maintenance.

Our committee surveyed the states to secure information on the present use of insecticides along highways in 1955. The results are summarized in Table I.

**Table I.**

**Cost of Insecticides Used Along Highways in 1955**

| State* | Insecticides Used | Insects Controlled | Total Cost of Insecticides** |
|---|---|---|---|
| California | | | $2500-5000 |
| Colorado | | | Less than $1000 |
| Connecticut | Chlordane<br>DDT<br>Aramite | elm bark beetle<br>elm bark beetle<br>cankerworms<br>Japanese beetle | 17,200 |
| Delaware | DDT, BHC | mosquitoes | 17,980 |
| Iowa | dieldrin | grasshoppers | 250 |
| Illinois | toxaphene<br>DDT<br>lead arsenate | elm leaf beetle<br>bagworm<br>cankerworm | 1,361 |
| Kansas | DDT<br>malathion | | Small |
| Massachusetts | DDT | mosquitoes | 23,540 |
| Michigan | DDT<br>lead arsenate<br>malathion | pine shoot moth<br>pine sawfly<br>pine weevil | 250 |
| New Hampshire | lead arsenate | gypsy moth<br>tent caterpillars | 250 |
| New Jersey | lead arsenate | bagworm | 2500-5000 |
| Ohio | DDT<br>malathion<br>chlordane | mosquitoes<br>flies | 678 |
| Rhode Island | DDT<br>lead arsenate | elm bark beetle<br>elm leaf beetle | 2,670 |
| Virginia | DDT<br>lead arsenate | bagworms | 669 |
| TOTAL | | | $68,848-75,848 |

* No reports received from Arkansas, Georgia, Indiana, Utah, Vermont. No insecticides used in Alabama, Arizona, Colorado, Florida, Idaho, Kentucky, Louisiana, Maine, Maryland, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Mexico, New York, Nevada, North Carolina, North Dakota, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Washington, West Virginia, Wisconsin, Wyoming.

** Includes cost of chemical only. Does not include cost of application.

The highway is normally maintained for a distance of ten feet from the pavement on each side of the road or equivalent to 2.5 acres per mile. The 43 states responding to this survey represent 820,757 miles or 2,051,892 acres subject to maintenance. Insecticides were applied to approximately 17,000 miles or equivalent to 2.0 per cent of the total mileage was treated one or more times with insecticides.

In a similar survey a total of $628,320 was spent for cost of herbicides to treat 7.3 per cent of the mileage. Essentially no fungicides were used in the states.

The use of DDT to control the vector of Dutch Elm disease is cheaper than the average cost of $80 to remove a diseased elm tree, according to costs for the Connecticut Highway Department.

The use of 2000 pounds of chlordane in Connecticut and less than $1000 worth of lead arsenate in New Jersey represents the total expenditure for control of soil insects on over two million acres of maintained turf.

The regular Federal Aid program, administered by the Bureau of Public Roads, which is distinct from the new Federal Aid Highway Bill, allocates 2½ billion dollars per year to the states. A provision in this program provides 1½ per cent of this fund on a yearly basis for research on highway problems. This research fund has, in the past, been used primarily for physical research on highway materials. There is a recent trend to the use of these funds for research which might include evaluation of chemicals to reduce maintenance costs. Such research projects are initiated through the materials or research engineer of each state highway department.

[1] Secretary and [2] Chairman, Chemical Subcommittee, Committee on Roadside Construction and Maintenance, American Road Builders' Association.

[1] Naugatuck Chemical, Division U.S. Rubber Company, Bethany, Connecticut.

[2] Niagara Chemical Division, Food Machinery Corp., Middleport, New York.

## THE ENTOMOLOGICAL SOCIETY OF SOUTHERN AFRICA

Institutions can obtain the *Journal* and *Memoirs* of this Society by paying an annual subscription of £3.0.0. (All payments must be in South African currency). Standing orders are preferable.

Persons who wish to become members of the Society may obtain details of membership and application forms by writing to the Honorary Secretary.

*Journal of the Entomological Society of Southern Africa*

The annual Volume of the *Journal* is now published in two parts. Papers deal mainly with the taxonomy, biology, ecology and control of African insects of agricultural, veterinary and medical importance. Over 4,000 pages have been published since 1939. Volume 20, Part 1, is due to appear in June, 1957.

The prices of published volumes of the *Journal* are as follows:

| | |
|---|---|
| Volume I (1939) | £2. 0. 0 |
| Volume II (1939) | £3.10. 0 |
| Volume III (1940) | £2.10. 0 |
| Volumes IV (1941) to VIII (1945) per volume | £2. 0. 0 |
| Volumes IX (1946) to X (1947) per volume | £3. 0. 0 |
| Volumes XI (1948) to XIII (1950) per volume | £2. 0. 0 |
| Volumes 14 (1951) to 19 (1956) per volume | £3. 0. 0 |

*Special offer:* A limited number of complete sets of Volumes I to 19 (1939 to 1956) of the *Journal* (containing over 4,000 pages and including a free copy of Memoir No. 1) is now offered at *a discount of 40 per cent* to all new subscribers. The price for 19 Volumes will thus be £28.16.0. (The full price would be £48.0.0). Orders for full sets must be sent as soon as possible.

Subscribers who require the first 16, 17 or 18 Volumes of the Journal may also obtain them at reduced prices (£27.9.0, £27.18.0 and £28.7.0, respectively). A discount of 25 per cent is allowed on orders for 10 to 15 consecutive Volumes.

**Memoirs**

The *Memoirs* of the Society form a growing series of longer and more comprehensive papers. All full members and subscribers receive the

*Memoirs* as well as the *Journal*. The *Memoirs* are at present published with the aid of a grant from the South African Council for Scientific and Industrial Research. The *Memoirs* which have been published are listed below:

No. 1 Munro, H. K. African Trypetidae (Diptera). 1947. 300 pp. 348 figs. 2 plates. Price £2. 0. 0

No. 2 Ullyett, G. C. Biomathematics and insect population problems. A critical review. 1953. 89 pp. 21 figs. Price 15. 0

No. 3 Steyn, J. J. The pugnacious ant (*Anoplolepis custodiens* Smith) and its relation to the control of citrus scales at Letaba. 1954. 96 pp. 37 figs. Price 15. 9

No. 4 Muspratt, J. The Stegomyia Mosquitoes of South Africa and some neighbouring territories. 1956. 138 pp. 20 figs. Price 15. 0

No. 5 Omer-Cooper, J. Dytiscidae (Coleoptera) collected in the Transvaal. In the press. 88 pp. Price 15. 0

We regret that the exchange of publications cannot be considered as the Society does not maintain a library.

Please address all correspondence and orders to:

The Honorary Secretary, Entomological Society of Southern Africa, P.O. Box 103, Pretoria, South Africa.

## North Carolina Entomological Society

The December 1956 issue of the BULLETIN contained the interesting paper *Entomological Societies* by C. W. Sabrosky. The North Carolina Entomological Society was formed November 17, 1956, which was after Mr. Sabrosky's paper went to press. We welcome this new Society to the international brotherhood.

The 1957 officers, who are also members of the Entomological Society of America are as follows:

*President:*

Clyde F. Smith
Department of Entomology
North Carolina State College
Raleigh, North Carolina

*Vice-President:*

F. R. Lawson
USDA, Box 1011
Oxford, North Carolina

*Secretary-Treasurer:*

J. F. Green
Division of Entomology
North Carolina Department of Agriculture
Raleigh, North Carolina

## ABSTRACTS

The attention of all who are planning to submit papers to the JOURNAL OF ECONOMIC ENTOMOLOGY or to the ANNALS is called to *Important Notice to Authors* on page 1.

## AMATEUR ENTOMOLOGY

By ALVAH PETERSON

An amateur entomologist is one who loves to work or play with insects as a hobby without financial compensation. Most members of the E.S.A. started as amateurs. We took on a professional rating when we received pay for doing the thing we most liked to do. Too many people misuse the work amateur. They entertain the idea that an amater is a beginner. A dictionary definition of amateur makes no reference to nor does it imply that an amateur is a beginner. An amateur may be a highly qualified expert in his or her field. In the United States today there are a few expert amateur entomologists. The purpose of this article is to encourage the development of more amateur entomologists with the hope that some may become experts.

In the field of biology, especially zoology, bird lovers constitute the strongest and most extensive group of amateurs. For example in the state of Ohio there are numerous, active, local groups of bird enthusiasts in many towns and cities. Their membership must total more than a thousand persons who conduct observations on birds and support local and national societies, such as the Audubon Society and numerous local nature clubs.

How many adult amateur entomologists exist in Ohio? It would be difficult to name more than a handful, especially if we exclude a few small groups interested in apiculture as a hobby. Why does this difference exist? Except for physical size what do birds offer that insects cannot match? Most insects can fly, many can chirp or sing, some construct unusual homes and numerous species have colors that are more varied and ornate than those found among birds.

Insects also offer possibilities for awakening amateur interest which birds cannot equal. In most any habitat or local situation the population of a given species exceeds greatly that of any bird. In Ohio some 320 species of birds have been recorded. The number of insect species in Ohio would be at least fifty times greater than 320.

Most adult insects are easy to collect, kill and preserve on a pin for many years. Try to make a collection of bird species. You soon run into legal restrictions galore. Also they are difficult to kill without injury and not easy to preserve.

Many insects can be reared easily and continuously in great numbers, some within small containers. Others can be reared partially, namely moths from cocoons, dragonflies from naiads, flies from puparia, and parasites from larvae. Rearing is fun, especially for some when the end product is used to feed animal pets or for bait to catch a bass or a pan fish. Have you ever tried to rear a wild bird in confinement? This is difficult, expensive and again subject to legal restrictions.

Insects can be and are used in the production of jewelry, colorful trays and pictures, plastic table ware and in other merchandise. In the good old days wild bird skins and wings were used on ladies' hats. Fortunately this is no longer permissible. Along this line it is interesting to note that insect designs are common today in wearing apparel, table cloths, wallpaper, greeting cards, pottery, tropical art and elsewhere.

Birds are so admired and loved by man that they are protected extensively by legal restrictions. They are also provided havens where they can live unmolested. It is a rare event for an insect to be protected. Most legislation bearing on insects relates to control or extermination. Biological control investigators and bee men pray for the day when our honey bees, parasites and predators will receive some

protection against the use of potent insecticides and also herbicides that destroy food plants for many beneficial, harmless and beautiful insects.

Do you know that in some foreign countries adult amateur groups interested in insects are numerous. Japanese entomologists tell us that in most cities in congested Japan at least one amateur insect society exists and in some cities as many as five. Many of these groups have their own publications. Also in many high schools there are insect clubs. Why should this be true in Japan but unheard of in the United States?

As professional entomologists we are in part responsible for this lack of amateur interest. Most of us have done little or nothing to encourage adult interest in insects except to instill a negative approach, namely "Kill your Insect Enemies." Along this line we have done a superb job. So much so that most Joe Smiths and our ladies despise insects and do what they can to destroy any bug they see. Few are aware of the fact that less than one per cent of all insects are major pests and almost no one knows that beneficial species are many times more abundant than destructive pests. Seldom do you find a person aware of the fact that man is very dependent upon insects for the production of 50 or more crops or know that many important biological facts in genetics, physiology and pathology have been ascertained by studying insects.

The writer fears that the average applied entomologist is so submerged in dusts and sprays and the professional taxonomist so embedded in setae, genetalia and subspecies that he has forgotten his early amateur interest in insects before he became a professional. Today he is so busy in his little world he does not want to be bothered with amateur entomology. The writer has been negligent himself. Looking back he knows that he could have done more to encourage amateur interest, especially among teen-agers.

If we want to build a strong future for entomology one of the best ways is to encourage amateur interest by working with youngsters, teen-agers and adults. The "Oh my" wonders among insects and the wide variety of possibilities for developing a keen interest certainly equals or exceeds that of birds.

Eventually we might dream about a national amateur insect group comparable to the Audubon Society which might be called a Comstock, Fernald or Howard Society, or some other name. Or the Entomological Society of America might establish a subdivision for amateur entomologists. Before this can take place in the distant future, numerous, active, local, adult groups must be established in our towns, cities and high schools. After these clubs are well established they may want an outlet for publishing interesting and valuable field observations on insects which could be of distinct value to professional entomologists. Professional entomologists are in position to lend great help to local groups and cooperate with the Academy of Science junior programs in many states.

The idea expressed in the foregoing article is something the writer has been thinking about for sometime. If it appeals to you as good sense then do whatever you can in your locality to stimulate amateur interest in insects other than the deadening idea of "Kill that bug."

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# THE TEACHING OF BIOLOGY TO PRE-COLLEGE STUDENTS

By I. E. WALLEN [1]

One of the peculiarities about our modern system of education is its prolific use of terms. Particularly, it is true in the Sciences that special fields are budded from the general fields for many years and then begin to rejoin as the area of separation is investigated and no actual borderline is found. Cooperation among College Science departments is essential when Zoology, Botany, Entomology, Bacteriology, Physiology and other departments all contribute to the training of *Biologists* for high school teaching.

How many and what kind of high school teachers do we now have? By making estimates from the number of entering teachers assigned to Biology in the 1956 Supply and Demand Report by the National Education Association (3) and from the 1956 Office of Education enrollments study (1), it would seem that the teaching of Biology to secondary school pupils was accomplished by the use of roughly 20,000 teachers who have either a major or a minor assignment in Biology. Approximately one third of the new teachers of Biology in the NEA study (3) were assigned only to Biology. Since new teachers are likely to get poorer assignments of teaching loads, it seems possible that nearly one half of all teachers of Biology now teach only Biology.

The Biology teachers would then comprise about 5% of the estimated total secondary school teaching staff of 412,138 persons. If General Science (9%), Chemistry (2%), and Physics (1%) teachers are added, the Science Staff seems to represent about 17% of the secondary school teachers or about one teacher in 6. Mathematics teachers, by similar computations, make up more than 11% of the staff so that more than one-fourth (estimated 112,300) of the high school staffs would be involved in programs to improve science and mathematics teaching. Since these figures do not include remedial mathematics or high school arithmetic they are somewhat lower than the total would otherwise be. If we can assume that Biology teachers come from the average source, almost 20% of them are prepared in teachers colleges, slightly over 40% are prepared by General Colleges and slightly under 40% are prepared by Universities.

Of those prepared with full legal qualifications between September, 1954 and August, 1955, only 55% of the Biology teachers were teaching on November 1, 1955, as compared with 63% of all high school teachers prepared during the same period (2). This occurred in spite of the largest high school enrollment of all time and of the fact that 50% fewer teachers were prepared in 1955 than in 1950 (3).

Although 913 new teachers of Biology were hired in 1955-56 in the 29 states, Hawaii, Puerto Rico and the District of Columbia summarized in the NEA study (3), only 550 of the teachers had just completed their training with minimum legal qualifications.

I would certainly agree with the person who said: "It is just as hard to teach a course you have never had as to come back from a place you have never been."

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[1] Presented December 27, 1956, Fourth Annual Meeting, Entomological Society of America. The ideas of Professor J. J. Davis of Purdue University were helpful in the preparation of this paper and are gratefully acknowledged.

Not all schools teach Biology. Those schools that fail to do this are almost always small. A concerted, national effort must be made to consolidate school districts until all schools are large enough to afford to provide an equal opportunity to all of our youth. In Nebraska and South Dakota there are more school board members (17,400 and 9,957) than there are on the total instructional staffs (13,503 and 7,854) (2). In New Jersey each high school enrolls more than 400 students. All students may take Biology in New Jersey; many are denied the right in the two states listed and in other states.

Miss Shirley Tousch, working as a graduate student with Dr. Herman King of Michigan State University, recently made a study of the status of the teaching of Entomology in the Michigan School System. I would like to again report some of her results and conclusions (4).

She found that, although the study of insects was included in 97% of the high school Biology courses and 31% of the General Science courses, nearly one half (47%) of the Science teachers had no Entomology courses on their college transcripts. Two-and-a-half weeks was the average time spent on insects in Michigan Biology classes and three or four days were spent on insects in the General Science courses (4).

She found that although 81% of the schools have collection equipment, only about 50% take even a single field trip and only 46% make collections of any kind. Only 76% of the Biology classes have specimens of insects (4). Estimates state that insects outnumber humans by at least 500,000 to one at any one time. There would seem to be no excuse for any teacher to lack specimens.

In spite of the fact that we have a long ways to go toward an adequately trained staff of teachers, it seems true that some of our teachers are better prepared today than ever before. There are many teachers throughout the country with a good background in Biology. One of the present sources of trouble is that Elementary teachers do so well that much of the secondary curricula needs to be revised to include more and stronger subject matter.

The chemists have accepted the fact that many high school teachers do an excellent job of preparation of students by providing advanced standing examinations at college entrance so that students can omit the elementary course. I should like to suggest that the pressure will soon be sufficiently great on college Biology departments to do the same type of thing.

As the word gets back that there is a reward in terms of college selection of courses, based on quality, it will become easier for the high school teacher and student to be enthusiastic about Biology.

There seems to be little doubt that the success of really outstanding teachers hinges on their tremendous enthusiasm for their subject. We hear so much about the "father image" in the field of psychiatry that I wonder, if this is not also applicable here. The student, who gets real enjoyment from association with a good Biology teacher, must wish to become a Biologist, at least in part, to continue this type of association.

It is perhaps important to consider for a few minutes those things that seem to be important to the enthusiastic teacher.

The teacher usually will say that he does not use a standard approach to a class. He plays the class "by ear." He uses all his native senses to tell him what the class enjoys doing. He explores new ideas until he is able to find a spark of interest. Then he projects the existing interest into the years' work in Biology.

He may follow a schedule outwardly but is never tied to it. He starts off in many directions as suggested by student questions, but always finds a way to relate the question to the lesson at hand and to the principles to be learned by the student. He knows his subject thoroughly. When he says that an answer is not now known to Scientists, the student feels challenged to help discover an answer.

He is ready to suggest to any student that the student examine a problem to determine if the answer is available. He knows where to send the student to get library information. He knows how to develop experiments. He is anxious to help the student solve problems, but never quite ready to solve the problem for the student.

First and foremost a teacher surrounds himself with useful materials and *uses* them. He has laboratory equipment of simple types and of complex types. He is able to offer substitutes for equipment that is not available. In Biology he realizes that there is no substitute for living things and uses the resources of his community, whenever practical.

The teacher must know the plants and animals of his community. He needs to be able to predict when and where insects and other organisms will remain dormant and when they will become active. If a pond is available, he spends a considerable time studying its inhabitants. If he has a woodlot, he knows the trees, insects, and other common forms by name; if he has only a grass lawn he is aware of the many organisms that may be studied there.

He eliminates weather problems by keeping selected animals in his laboratory for indoor "field trips." He modifies his schedule to study the outdoors when weather is favorable. He encourages his bright students to use their ingenuity in preparing demonstrations and projects. He finds time for explanations of how, what and why the projects are interesting.

The consistency of form and structure of species and the variety of accessible species make insects an ideal hobby for collectors. Children with an interest of this type can as easily be directed to insects as to stamps and coins. Certainly, the educational value of insects as a hobby is not *inferior* to that inherent in stamp or coin collections.

Insects also lend themselves to a variety of other hobby or project ideas. Clay, soap carved, plastic, or plaster of paris models and mounts are fascinating to many children. To a budding microscopist, an insect offers the ideal subject since it is relatively easy to find and easy to mount, and it is rewarding to the observer.

The establishment and study of living colonies of insects is very interesting. Studies of metamorphosis without living examples is a crime when such a small amount of time is needed to prepare for the topic. Ecdysis and parthenogenesis, for example, are easily taught with living insects and very difficult without them.

How does one get Entomology into those courses now in existence? The real key lies in teacher preparation. How many college teachers of Entomology serve on State Certification Boards?—or on their own College Certification Committees? How many teachers or entomologists serve on School Boards? How many teachers in Entomology departments of land grant colleges also teach General Biology? How many teachers of Entomology write high school texts? How many teachers of Entomology serve on the staffs of Summer Institutes or Workshops for teachers? How many professional and college entomologists give lectures to high school teachers' meetings or to high school students?

All of these questions can be reserved to say that these are ways to get more effective Entomology and Biology teaching into the secondary schools—and into the elementary schools, too. No single one of them is a best approach in any community. The professional Biologist must also "play by ear" when he decides to do something to improve the teaching

of Biology. It is even encouraging to see that *you* have sufficient concern about the problem to place the topic on the program for discussion.

Fortunately, there are many groups of persons who are devoting a lot of thought and activity to discovering avenues of escape from the present situation. At least three large school systems (Miami, Florida, Los Angeles, California, and St. Paul, Minnesota) are engaged in planning the curriculum from grades 1 through 12 so that science and mathematics are given more consistent attention. The Manufacturing Chemists' Association is planning to distribute teacher-student subject matter science materials for grades 6 through 12 at a cost of approximately $1,000,000. It would seem that freshman college courses should not merely repeat the high school science courses. Examination of the content of the existing courses is proving to be a profitable activity for both pre-college and college Biologists. In order to expedite the use of new ideas and better implement the old ones, the Committee on Educational Policies of the Biology Council of the National Academy of Sciences—National Research Council has developed plans for series of conferences to write sourcebooks of good laboratory ideas for the use of textbook writers and classroom teachers.

A re-evaluation of the use of laboratories in teaching science is taking place throughout the country. It seems to be very important that the person who sees the value of laboratory instruction express this view. Crowding of classrooms and difficulties with scheduling have taken the laboratory out of much of science teaching.

One compromise that seems to be established in colleges is finding its way into the high school. Laboratory instruction is accepted as necessary for those students who will go on in science. At the pre-college level it would seem necessary to choose for the laboratory sciences all those with sufficient intelligence to handle abstract thinking. For those students who do not need training in the use of laboratory equipment for illustrative learning, because of lack of ability, the required science may be given as a demonstration-discussion subject.

The time is past when we must apologize for attempts to point out the advantages of the study of science and mathematics to young people. A positive recruitment program must be undertaken. This type of activity must begin early in the school system and continue throughout the training period. Many persons state that they have always planned to be scientists and that encouragement only made it possible.

Others may be like myself. I only became convinced that I wanted to try to be a scientist in my senior year in College, while training to be a high school teacher. At this point the head of the College Zoology Department offered me a job as laboratory instructor. This experience provided the strong motivation that held up through four years of war experience and four additional years of College.

The uses of the fellowship and of the scholarship as recruitment devices are being widely recognized. Industry and Government have joined the University in this activity. Summer, science related, jobs for teacher and student; summer institutes for teachers and for students; merit scholarships; tuition scholarships, are all increasing in number. Many colleges now offer their undergraduate department Majors an opportunity to participate in the departmental program.

In attracting students to Entomology as in other sciences the early recognition of gifted students is essential. A Chemistry Professor at a small college in Ohio explained how this works. For several years the average number of Chemistry majors was five along with the same number in Biology and Physics. This professor began visiting all local high schools asking to talk to bright Junior students. Each year he went back and talked to the new group of Juniors. He contacted his "friends" as Seniors and invited them to his office when they came to college. He was in his office when they came. Within five years he had 50 majors in Chemistry, while Biology and Physics each still had five.

These trips actually can accomplish other things. The high school teachers became "friends" of the college and of Chemistry. Career pamphlets and other guidance materials found their way into the hands of School Principals and Guidance Teachers. The students were given scholarship information. The Professor was able to recommend high school students for apprentice work at the College and Industrial establishments. The students were identified and recognized and thus felt it was important to take more science and to work harder in the courses offered.

Some projects that may contribute to better pre-college teaching are listed here. Entomologists may wish to engage in these or similar activities.

(1) The American Medical Association and other groups are getting interested in high school science clubs and science fairs.

(2) The AAAS is sending selected science books as a traveling library to selected schools.

(3) Guidance materials are being distributed in quantity by NEA, the American Chemical Society, Industrial and many other groups.

(4) Activities of Junior Academies of Science are increasing.

(5) The American Society for Metals gives awards to high school students for good projects.

(6) The Oak Ridge Institute of Nuclear Studies is sending exhibits of many types to high schools. They also send demonstrator teachers to aid in presentation of laboratory science to students.

(7) The Atomic Energy Commission proposes to send basic science laboratory equipment to schools that could not otherwise afford to offer science.

(8) The Science Teaching Improvement Program of AAAS is conducting a study on the use of Science Counselors to provide many kinds of assistance to teachers who desire this service.

(9) The Federal Government hopes to legislate some sort of a solution to the problem in the near future.

(10) The NSF will support 95 summer institutes and 16 year long institutes.

There are several other approaches to the motivation and training of pre-college students that could be considered. Many other methods have been tried and serve to illustrate the magnitude of the problem.

It would seem to be an insurmountable task to produce a lasting effect on the teaching of Biology, except as a coordinated approach is made by many other dedicated scientists like yourselves who have the will and the tenacity to keep resolving small portions of the problem until the whole problem will no longer exist.

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## MALARIA ERADICATION

The solution of the international public health problem of highest priority in the Americas was advanced one step forward by a special contribution of $1,500,000, made by the United States Government on March 7, 1957, to increase the Special Fund of the Pan American Sanitary Organization for malaria eradication.

"Malaria is still a leading cause of death in many parts of the world, including some areas in the Americas," stated Dr. Fred L. Soper, Director of the Pan American Sanitary Bureau, Regional Office of the World Health Organization, in a ceremony in which the representative of President Eisenhower, Dr. Milton S. Eisenhower, presented the check from his government.

"Its continued existence anywhere in this hemisphere threatens reinfection in all areas where malaria has been eradicated," Dr. Soper added. "Science has given us a powerful new weapon in the residual insecticides, such as DDT, which make the eradication of malaria possible and practicable throughout the Americas. But there is also a deadline we must meet," he continued, "since mosquitoes eventually develop resistance to these insecticides. If we move too slowly, the job becomes vastly more difficult and costly. That is why we have given first priority to the malaria eradication program. The Pan American Sanitary Organization is urging governments to expand and accelerate their national eradication programs."

Each year some 250,000,000 persons are afflicted with this disease throughout the world, some 2,500,000 dying of it annually. Here in the Americas, there are still extensive malarious areas and there are only a few countries where it is non-existent or has been eradicated. Malaria has been eradicated from the United States, for instance, only in the past three years.

With the development of the newer residual insecticides, the possibility was seen to eradicate malaria from the whole Hemisphere by destroying the anopheline mosquitoes that carry the disease in infected areas.

Some six years ago the twenty-one American Republics, meeting at the XIII Pan American Sanitary Conference, in 1950, determined to intensify and coordinate all the anti-malaria work in the Americas, looking toward its eradication.

Four years later, at the XIV Conference, steps were taken to develop a concrete program for the eradication of malaria from the Americas, a program now well under way. This was followed by action taken by the World Health Assembly, in 1955, at which the American initiative was reinforced and expanded by a call for a world-wide malaria eradication program.

In assessing the extent of the problem in this Hemisphere, the Pan American Sanitary Bureau finds that the malarious areas in the Americas embrace some 500,000 square miles with a population of over 80,000,000 inhabitants exposed to this disease. (These figures do not include Bolivia, Brazil and Honduras, for which exact figures are not yet available.) That is the extent of the problem.

Under the leadership of the Pan American Sanitary Bureau, which has set up a special Malaria Eradication Program, practically all of the sixteen countries in the Americas that had malaria control programs up to 1955 have now converted them to full-fledged eradication programs. As an example, Mexico, with the largest malaria problem in the Hemisphere, has launched an extensive eradication program. In the next five years nearly 5,000,000 houses will be sprayed throughout the malaria-infected areas of the country and it is expected that eradication will have been completed in that period.

It is calculated that the total cost of eradicating malaria in the Americas will run to approximately $156,000,000. The resources available for this task, both international and national funds in the countries immediately concerned, are estimated at $127,000,000, spread over a five year period. That means that some $29,000,000 additional funds will have to be raised for completion of eradication in the Hemisphere.

According to present plans, the special fund of $1,500,000 contributed by the U. S. Government to the Pan American Sanitary Organization will be used for the assignment of international technical personnel to work with governments on individual projects ($676,000); for training schools and fellowships ($195,000); for technical direction and coordination ($108,000); technical advisory services supplied to governments ($80,000); collaboration with governments in the conduct of evaluation surveys ($214,000); and other services connected with the promotion and expansion of the various national eradication programs ($227,000).

This special contribution is in addition to the funds available for malaria eradication activities in the regular budget of the bureau, and from the regional allocations of funds made by the World Health Organization to the bureau, which serves as regional office of WHO in the Americas. United Nations technical assistance funds are also made available through the WHO for public health programs including malaria eradication. And very substantial contributions of supplies and materials are made to the governments by the United Nations Childrens' Fund (UNICEF) for the malaria eradication program.

The existence of malaria poses an international problem and must be met by concerted, international effort. For this reason the Pan American Sanitary Bureau has been entrusted with the task of coordination and technical advice and over-all guidance in the development of the continent-wide eradication program.

But it is the individual governments that must bear the responsibility for the planning, the execution and the major part of the financing of the program in their respective territories. By discharging this responsibility they are contributing to the solution of the international problem. And they are coming more and more to realize that the benefits, both economic and social, of the total eradication of this disease far outweigh the sizable immediate costs.

## ANNUAL REVIEW OF ENTOMOLOGY

Volume 3 of this book will be published about February 1, 1958. See the announcement on the inside back cover of this issue of the BULLETIN. Order blanks for this important book will be sent to all members this summer. Those who do not have volumes 1 and 2 may order these along with volume 3. Members may also place standing orders to receive all copies as published.

ORDERS FOR VOLUME 3 SHOULD BE IN THE WASHINGTON OFFICE PRIOR TO DECEMBER 1.

# COMMERCIAL AND EXPERIMENTAL ORGANIC INSECTICIDES

## Indexed as to Their Scientific, Common and Trade Names, Code Designations, Uses and Manufacturers

By EUGENE E. KENAGA
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Entomologists and others concerned with insecticides and their uses are constantly confronted with the problem of keeping abreast of current and past developments on the subject of the chemical control of insects and arthropods.

In view of the great number of commercial and experimental insecticides which are being tested now and which have been used during the last decade, it is becoming increasingly difficult to recognize the relationships of the various chemicals which may be coded in several manners and given various synonymous chemical or trade names. The history of the development of an insecticide as recorded in the literature often begins with a coded number, an abbreviated chemical name or some other incomplete designation. Later, other more appropriate identifications are given, often without reference to the previous codings or names. It is as important to identify the "species" of insecticides as it is the species of insect when attempting to control an insect pest.

This report is written to bring together as much information as possible concerning all of the known organic commercial and experimental "insecticides." "Insecticides" in this paper are meant to include insecticides, acaricides, insect repellents, nematocides, fumigants and insecticide activators.

The method and basis of compiling information on commercial and experimental organic insecticides was as follows. All known insecticide manufacturers in the United States and some in Europe selling products in the United States were contacted and asked to supply information concerning their respective products. Only *manufacturers* of organic insecticidal *chemicals* per se are listed in this compilation. Companies who do not manufacture insecticidal chemicals but merely formulate and/or package insecticidal compositions are omitted. The insecticides included here are commercial or experimental materials. In order to be classified as experimental they must be "field tested." The results of these tests should be published in order for the insecticide to be included in this tabulation. The tabulation does not include long lists of analogues and homologues tested on a few organisms. Compounds do not have to be commercially available, since this compilation is meant to be a guide to experimental and commercial insecticides appearing in the literature now and in the past.

Manufacturers having insecticides which meet the above conditions were asked to submit certain information concerning their products, which was then tabularized as follows.

### Chemical Names Used

1. Name company prefers to use in publication at present.
2. Name used which is in accordance with the principles of *Chemical Abstracts* nomenclature.
3. Alternative company designation used in past but not used now (if found in publication). This does not necessarily include changes like reversed word order, parentheses, dropping of numbers and letters indicating positions of substituents, etc.

The numbers 1, 2 or 3 are used as defined above in the compilation to designate the authority of the chemical names.

The above insecticides were tabulated into convenient chemical or insecticidal groups as follows:

| *Code Letter* | *Name of Group* |
|---|---|
| A | Activators or synergists for insecticides |
| B | Botanicals and derivatives |
| C | Chlorinated aryl hydrocarbons (containing 6 or more chlorines) |
| D | DDT relatives (diphenyl alkanes) |
| F | Fumigants (regardless of structure) |
| H | Heterocyclic compounds |
| M | Miscellaneous aryl compounds |
| N | Nitrophenols and derivatives |
| P | Phosphorus-containing compounds |
| R | Repellents (regardless of structure) |
| S | Sulfonates, sulfides, sulfones, sulfonamides, sulfites |
| T | Thiocyanates |

### Manufacturer of Chemical and Chemical Availability

1. All manufacturing companies are listed in alphabetical order. Companies no longer making certain insecticides are differentiated from those presently making these same insecticides. Each company was asked to classify the availability of the compounds which it now makes or has made in the past as follows:

   a. Not available.
   b. Available in research quantities
   c. Limited commercial quantities
   d. Commercial quantities

   The letters a, b, c and d in parentheses which follow the manufacturers' name in the table indicate the availability status of the chemical.

2. With DDT and benzene hexachloride and some other common insecticides and fumigants, it is necessary to restrict the list to manufacturers *presently* making the compound.

### Type of Insecticidal Activity

1. The manufacturer has indicated the use for which the insecticide was intended as it fits the following categories:

   Insecticide (Ins.)
   Acaricide (Acar.)
   Systemic insecticide (Sys.)
   Insecticide activator (synergist) (Syn.)
   Repellent (RP)
   Commodity or space fumigant (C. fum.)
   Soil fumigant (insecticide) (S. fum.)
   Mothproofer (MP)
   Nematocide (Nem.)

   Abbreviations shown in parentheses above are those used in the table to indicate the type of insecticidal activity.

**Other Designations**

1. "Other designations" includes common names, letter and number designations, trade names, trademarks, etc., used by the company(ies) introducing an insecticide to experimental or commercial use. All trademarks and other proprietary names are capitalized. Letter marks, however, may be abbreviations of chemical names and are not necessarily proprietary. No attempt whatsoever has been made to match any of these names line for line with the manufacturer in the compilation. Names which are in italics are common names which are required for use in all publications of the Entomological Society of America. (H. L. Haller, JOURNAL OF ECONOMIC ENTOMOLOGY 50(2):226-8, 1957.) The foregoing paper also includes a list of proprietary names of noncompetitive products which the Entomological Society of America uses in its publications.

**Indexing Procedures**

Insecticide information classified according to the above outline is found on pages 15 to 30. On some occasions only the common name or trade name, code letter or number or manufacturer is known or available to a person looking for further data on an insecticide. Indexes to all of these items are useful to refer back to the table where the chemical name and other more complete information on the item in question is summarized. The indexes are organized as follows:

1. Common and Manufacturers' Names Index (see pages 31 to 32)

   This index includes the non-scientific common names, trade names and names previously defined in "other designations." These names are listed in alphabetical order.

2. Number Index (see pages 32 to 33)

   Many compounds are listed as numbers. The materials have been listed (regardless of their prefixes or suffixes) in numerical order.

3. Letter Index (see pages 33 to 34)

   Many compounds are listed as letters. The materials have been listed (regardless of prefixes or suffixes) in alphabetical order.

4. Insecticide Use Index (see pages 34 to 35)

   The uses of the various "insecticides" are indexed under the following categories: acaricides, commodity fumigants, insecticides, insecticide activators (synergists), insect repellents, mothproofers, nematocides, soil fumigants and systemic insecticides.

5. Insecticide Manufacturers' Index (see pages 35 to 36)

   The insecticide manufacturing companes are listed in alphabetical order, both in the compilation and the index. The products of each manufacturer are listed alphabetically according to the chemical name code letter used in the table. Companies which have merged are indicated by reference to the name of the company now being used.

In compiling this report, considerable time was spent in checking the completeness and accuracy of the data appearing in the text, table and indexes. In a report of this scope, however, it is impossible to guarantee perfection. Thus, neither the Entomological Society of America, Eugene E. Kenaga, nor The Dow Chemical Company can take responsibility for errors in the data.

| Code | Authority | Chemical Name | Manufacturer of Chemical and Availability | Chemical Use | Other Designations for Chemical and its Compositions |
|---|---|---|---|---|---|
| A-1 | 1,2 | α-[2-(2-butoxyethoxy)-ethoxy]-4,5-methylenedioxy-2-propyltoluene | Fairfield (d)<br>U.S. Industrial (a) | Ins.<br>Syn. | *piperonyl butoxide* |
| | 3 | butylcarbitol-6-propyl-piperonyl ether | | | |
| A-2 | 1, 2 | mixture of 3-alkyl-6-carb-ethoxy-5-(3,4-methylene-dioxyphenyl)-2-cyclohexen-1-one and 3-alkyl-5-(3,4-methylenedioxyphenyl)-2-cyclohexen-1-one | Fairfield (d)<br>U.S. Industrial (a) | Syn. | *piperonyl cyclonene*<br>piperonyl cyclohexenone |
| A-3 | 1 | di-*n*-propyl-3-methyl-6,7-methylenedioxy-1,2,3,4-tetrahydronaphthalene-1,2-dicarboxylate | Penick (d) | Syn. | *propyl isome*<br>n-propyl isome |
| | 2 | dipropyl 5,6,7,8-tetra-hydro-7-methylnaptho-[2,3]-1,3-dioxole-5,6-di-carboxylate | | | |
| | 3 | di-*n*-propyl maleate iso-safrole condensate | | | |
| A-4 | 1 | 2,6-bis(3,4-methylenedioxy-phenyl)-3,7-dioxabicyclo-[3.3.0]octane | Shulton (?) | Syn. | *sesamin* |
| | 2 | Sesamin | | | |
| A-5 | 1 | 2-(3,4-methylenedioxy-phenyl)-6-(3-4-methylene-dioxphenoxy)-3-7-dioxa-bicyclo[3.3.0]octane | Shulton ? (?) | Syn. | *sesamolin* |
| | 2 | Sesamolin | | | |
| A-6 | 1 | 2-(3,4-methylenedioxy-phenoxy)-3,6,9-trioxa-undecane | Shulton (b) | Syn. | Sesoxane |
| | 2 | acetaldehyde 2-(2-ethoxy-ethoxy)ethyl 3,4-methylene-dioxyphenyl acetal | | | |
| A-7 | 1, 2 | 1,2-methylenedioxy-4[2-(octylsulfinyl)propyl]-benzene | Penick (d) | Syn. | *sulfoxide*<br>Sulfox-Cide |
| | 3 | *n*-octyl sulfoxide of isosafrole | | | |
| A-8 | 1,2 | N-(2-ethylhexyl)-bicyclo-[2.2.1]-hept-5-ene-2,3-dicarboximide | MGK (d) | Syn. | MGK 264<br>Octacide 264<br>Van Dyke 264 |
| | 2 | | | | |
| | 3 | N-octyl bicycloheptene dicarboximide | | | |
| | 3 | N-2-ethylhexyl imide of endomethylene tetrahydro-phthalic acid | | | |
| A-9 | 1, 2 | N-isobutylhendecenamide | DuPont (a) | Syn. | IN-930 |
| | 3 | N-isobutylundecyleneamide | | | |
| A-10 | 1, 2 | 2-isovaleryl-1-1,3-indandione | Kilgore (a)<br>Motomco (?) | Ins.<br>Syn. | Valone |
| A-11 | 1, 2 | 2-tert-butyl-1,3-indan-dione | Kilgore (a)<br>Motomco (?) | Ins.<br>Syn. | Pivalyl Valone |
| | 3 | pivalyl indandione | | | |

## Botanicals and Derivatives

| Code | Authority | Chemical Name | Manufacturer of Chemical and Availability | Chemical Use | Other Designations for Chemical and its Compositions |
|---|---|---|---|---|---|
| B-1 | 1,2 | rotenone (from plant species *Derris* and *Lonchocarpus*) | Fairfield (d)<br>Olin-Math. (d)<br>Penick (d) | Ins. | rotenone<br>derris |
| B-2 | 1,2 | seeds of *Schoenocaulon officinate* (veratrine alkaloids) | Olin-Math. (d) | Ins. | sabadilla |
| B-3 | 1,2 | ground *Ryania specioca* stemwood (alkaloid ryanodine) $C_{25}H_{35}O_9N$ or $C_{25}H_{37}O_9N$ | Merck (a)<br>Penick (d) | Ins. | ryania |
| B-4 | 1,2 | pyrethrum (principally from plant species *Chrysanthemum cinariaefolium*) | Fairfield (d)<br>MGK (d)<br>Olin-Math. (d)<br>Penick (d) | Ins. | pyrethrum<br>pyrethrin I<br>pyrethrin II |
| B-5 | 1 | *dl*-2-allyl-4-hydroxy-3-methyl-2-cyclopenten-1-one esters of *cis* and *trans dl*-chrysanthemummonocarboxylic acid | Benzol Prod. (d)<br>Fairfield (d)<br>MGK (d) | Ins. | *allethrin*<br>allyl homologue of cinerin I<br>synthetic pyrethrins |
| | 2 | allethrin | | | |
| B-6 | 1,2 | *dl*-2-(2-cyclopentenyl)-4-hydroxy-3-methyl-2-cyclopenten-1-one esters of *cis* and *trans dl*-chrysanthemummonocarboxylic acids | Union Carbide (b) | Ins. | *cyclethrin* |
| | 3 | 3-(2-cyclopentenyl)-2-methyl-4-oxo-2-cyclopentenyl chrysanthemum carboxylate | | | |

## Chlorinated Aryl Hydrocarbons (containing 6 or more Chlorines)

| | | | | | |
|---|---|---|---|---|---|
| C-1 | 1 | benzene hexachloride | Columbia-Southern (d)<br>Diamond Alkali (d)<br>Frontier (d)<br>General Chem. (d)<br>Hooker (d)<br>Olin-Math. (d)<br>Penn Salt (d)<br>Stauffer (d)<br>Westvaco (d) | Ins. | *BHC*<br>HCH<br>666<br>gammexane |
| | 2 | 1,2,3,4,5,6-hexachlorocyclohexane mixed isomers | | | |
| C-2 | 1 | 1,2,3,4,5,6-hexachlorocyclohexane 99% or more gamma isomer | Diamond Alkali (d)<br>Hooker (d) | Ins. | *lindane*<br>gamma BHC |
| | 2 | lindane | | | |
| C-3 | 1 | 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan | Hyman (a)<br>Velsicol (d) | Ins. | *chlordane*<br>Octaklor<br>Octachlor<br>Velsicol 1068<br>1068 |
| | 2 | chlordan | | | |
| | 3 | 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-4,7-methanoindene | | | |
| C-4 | 1 | 3a,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene | Velsicol (d) | Ins. | *heptachlor*<br>Velsicol 104<br>E-3314 |
| | 2 | heptachlor | | | |

CHLORINATED ARYL HYDROCARBONS (containing 6 or more Chlorines)—continued

| Code | Authority | Chemical Name | Manufacturer of Chemical and Availability | Chemical Use | Other Designations for Chemical and its Compositions |
|---|---|---|---|---|---|
| C-5 | 1 | chlorinated camphene containing 67-69% chlorine | Hercules (d) | Ins. | *toxaphene*<br>3956 |
| | 2 | toxaphene | | | |
| C-6 | 1,2 | terpene polychlorinates (66% chlorine) | Goodrich (d) | Ins. | Strobane<br>compound 3961<br>Strobane AC-14 |
| | 3 | chlorination product of terpene hydrocarbons | | | |
| C-7 | 1 | not less than 95% of 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-endoexo-dimethanonaphthalene | Hyman (a)<br>Shell (d) | Ins. | *aldrin*<br>compound 118<br>Octalene |
| | 2 | aldrin | | | |
| C-8 | 1 | 1,2,3,4,10,10-hexachloro-1,4,4a,5,8-8a-hexahydro-1,4,5,8-*endo-endo*-dimethanonaphthalene | Hyman (a)<br>Shell (a) | Ins. | *isodrin*<br>compound 711 |
| | 2 | isodrin | | | |
| C-9 | 1 | not less than 85% of 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-1,4,5-endoexo-octahydro-dimethanonaphthalene | Hyman (a)<br>Shell (d) | Ins. | *dieldrin*<br>compound 497<br>Octalox<br>HEOD |
| | 2 | dieldrin | | | |
| C-10 | 1 | 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4,5,8-*endo-endo*-dimethanonaphthalene | Hyman (a)<br>Shell (d)<br>Velsicol (d) | Ins. | *endrin*<br>compound 269 |
| | 2 | endrin | | | |
| C-11 | 1 | decachlorotetrahydro-4,7-methanoindeneone | General Chem. (b) | Ins. | 1189 |
| | 2 | 2,3,3a,4,5,6,7,7a,8,8a-decachloro-3a,4,7,7a-tetrahydro-4,7-methanoinden-1-one | | | |
| C-12 | 1,2 | 5,6,7,8,9,9-hexachloro-1-4,2-3-diepoxy-1,2,3,4,-4a,5,8,8a-octahydro-5,8-methanonaphthalene | Shell (a) | Ins. | 52-RL-71 |
| C-13 | 1,2 | 5,6,7,8,9,9-hexachloro-1,4-epoxy-1,4,4a,5,8,8a-hexahydro-5,8-methano-naphthalene | Shell (a) | Ins. | 52-RL-45 |
| C-14 | 1,2 | 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-2,4,3-benzo-dioxathiepin 3-oxide | Niagara (b) | Acar.<br>Ins. | Thodan<br>BIO 5462<br>Hoe 2671<br>Malix |
| | | **DDT RELATIVES** | | | |
| D-1 | 1 | dichloro diphenyl trichloro-ethane | Diamond Alkali (d)<br>Geigy (d)<br>General Chem. (d)<br>Lebanon (d)<br>Mich. Chem. (d)<br>Monsanto (d)<br>Montrose (d)<br>Olin-Math. (d) | Ins.<br>MP | *DDT*<br>Chlorophenothene |
| | 2 | 1,1,1-trichloro-2,2-bis-(*p*-chlorophenyl)ethane | Penn Salt (d)<br>Stauffer (d) | | |

DDT RELATIVES—continued

| Code | Authority | Chemical Name | Manufacturer of Chemical and Availability | Chemical Use | Other designations for Chemical and its Compositions |
|---|---|---|---|---|---|
| D-2 | 1 | dichloro diphenyl dichloroethane | General Chem. (d)<br>Rohm and Haas (d) | Ins. | *TDE*<br>DDD<br>Rhothane |
| | 2 | 1,1-dichloro-2,2-bis-(*p*-chlorophenyl)ethane | | | |
| | 3 | tetrachlorodiphenylethane | | | |
| D-3 | 1,2 | 1,1,1-trichloro-2,2-bis-(ethylphenyl)ethane | Rohm and Haas (a) | Ins. | Q-128 |
| D-4 | 1,2 | 1,1,1-trichloro-2,2-bis-(*p*-methoxyphenyl)ethane | DuPont (d)<br>Geigy (d) | Ins. | *methoxychlor*<br>Methoxy DDT<br>DMDT<br>Marlate |
| | 3 | dianisyl trichloroethane | | | |
| D-5 | 1 | 2-nitro 1,1-bis(*p*-chlorophenyl) propane and butane mixture (1-2 ratio) | Comm. Solv. (c) | Ins. | Dilan<br>CS708 |
| | 2 | 1,1-bis(*p*-chlorophenyl)-2-nitropropane and butane mixture | | | |
| D-6 | 1 | 2-nitro-1,1-bis(*p*-chlorophenyl)propane | Comm. Solv. (a) | Ins. | Prolan<br>CS645A |
| | 2 | 1,1-bis(*p*-chlorophenyl)-2-nitropropane | | | |
| D-7 | 1 | 2-nitro-1,1-bis(*p*-chlorophenyl)butane | Comm. Solv. (a) | Ins. | Bulan<br>CS674A |
| | 2 | 1,1-bis(*p*-chlorophenyl)-2-nitrobutane | | | |
| D-8 | 1,2 | 1,1,1-trichloro-2,2-bis-(*p*-tolyl)ethane | Geigy (a) | Ins. | DTT |
| D-9 | 1,2 | 1,1-dichloro-2,2-bis(*p*-ethylphenyl)ethane | Rohm and Haas (d) | MP | Perthane<br>Q-137 |
| | 3 | 2,2-dichloro 1,1-bis(ethylphenyl)ethane | | | |
| D-10 | 1,2 | 1-(*p*-chlorophenyl)-2-nitro-1-(*p*-tolyl)propane | Comm. Solv. (a) | Ins. | CS728 |
| D-11 | 1,2 | 1-(*p*-chlorophenyl)-2-nitro-1-phenylbutane | Comm. Solv. (a) | Ins. | CS589 |
| D-12 | 1 | 4,4'-dichlorobenzohydryl chloride | Rohm and Haas (a) | Ins.<br>Syn. | MS-60 |
| | 2 | chlorobis(*p*-chlorophenyl)-methane | | | |
| D-13 | 1-2 | 1,1-bis(x(mostly *p*)chlorophenyl)ethane | Dow (a) | Acar. | K-3,926 |
| D-14 | 1 | 1,1-bis(*p*-chlorophenyl)-ethanol | Sherwin-Williams (d) | Acar. | Dimite<br>DMC<br>DCPC |
| | 2 | 4,4'-dichloro-*a*-methylbenzhydrol | | | |
| | 3 | 1,1-bis(*p*-chlorophenyl)-methylcarbinol | | | |
| D-15 | 1,2 | ethyl 4,4'-dichlorobenzilate | Geigy (d) | Acar. | Chlorobenzilate<br>Geigy 338<br>G23992 |
| D-16 | 1 | 1,1-bis(*p*-chlorophenyl) 2,2,2-trichloroethanol | Rohm and Haas (d) | Acar. | Kelthane<br>FW-293 |
| | 2 | 4,4'-dichloro-*a*-(trichloromethyl)benzhydrol | | | |
| | 3 | 1,1,1-trichloro-2-hydroxy 2,2-bis(*p*-chlorophenyl) ethane | | | |

DDT RELATIVES—continued

| Code | Authority | Chemical Name | Manufacturer of Chemical and Availability | Chemical Use | Other designations for Chemical and its Compositions |
|---|---|---|---|---|---|
| D-17 | 1 | 1,1-bis(*p*-chlorophenyl) 2,2-dichloroethanol | Rohm and Haas (a) | Acar. | FW-152 |
| | 2 | 4,4'-dichloro-*a*-(dichloro-methyl) benzhydrol | | | |
| | 3 | 1,1-dichloro-2-hydroxy 2,2-bis(*p*-chlorophenyl) ethane | | | |
| D-18 | 1 | ethoxymethylbis(*p*-chloro-phenyl) carbinol | Geigy (a) | Acar. | Etoxinol<br>Geigy 337<br>G23645 |
| | 2 | 4,4'-dichloro-*a*-(ethoxy-methyl) benzhydrol | | | |
| D-19 | 1 | 1,1-bis(*p*-chlorophenyl)-2-propyn-1-ol | General Chem. (a)<br>Rohm and Haas (a) | Acar. | 876<br>Mr-30 |
| | 2 | 4,4'-dichloro-*a*-ethynyl-benzhydrol | | | |
| | 3 | 4,4'-dichloro diphenyl-ethinyl carbinol | | | |
| | 3 | bis(*p*-chlorophenyl) ethynyl-carbinol | | | |
| | | **FUMIGANTS** | | | |
| F-1 | 1,2 | carbon tetrachloride | Diamond Alkali (d)<br>Dow (d)<br>Frontier (d)<br>Solvay (d)<br>Stauffer (d)<br>Westvaco (d) | C. fum | $CCl_4$ |
| F-2 | 1 | ethylene dichloride | Diamond Alkali (d)<br>Dow (d)<br>Olin-Math. (d) | C. fum | EDC |
| | 2 | 1,2-dichloroethane | | | |
| | 3 | ethylene chloride | | | |
| F-3 | 1 | propylene dichloride | Dow (d)<br>Union Carbide (d) | C. fum | |
| | 2 | 1,2-dichloropropane | | | |
| F-4 | 1,2 | 1,1,1-trichloroethane | Barrett (d)<br>Dow (d) | C. fum | Chlorothene |
| | 3 | methyl chloroform | | | |
| F-5 | 1,2 | trichloroethylene | Diamond Alkali (d)<br>Dow (d) | C. fum | |
| F-6 | 1 | tetrachloroethylene | Diamond Alkali (d)<br>Dow (d) | C. fum | |
| | 2 | tetrachloroethene | | | |
| | 3 | perchlorethylene | | | |
| F-7 | 1,2 | 1,3-dichloropropene and 1,2-dichloropropane mixture | Dow (a)<br>Shell (d) | Nem.<br>S. fum. | D-D mixture<br>Dowfume N |
| F-8 | 1,2 | dichloropropenes mixture | Dow (d) | Nem.<br>S. fum. | Telone |
| F-9 | 1,2 | hexachloropropene | Dow (b) | C. fum. | |
| F-10 | 1,2 | trichloroacetonitrile | I.G.Farben ? (?) | C. fum. | Tritox |
| F-11 | 1 | β,β'-dichlorodiethyl ether | Dow (d)<br>Olin-Math. (d) | C. fum. | *dichloroethyl ether*<br>Chlorex |
| | 2 | bis(2-chloroethyl) ether | | | |
| | 3 | 1-chloro-2(β-chloroethoxy)-ethane | | | |
| | 3 | sym. dichlorodiethyl ether | | | |

FUMIGANTS—continued

| Code | Authority | Chemical Name | Manufacturer of Chemical and Availability | Chemical Use | Other Designations for Chemical and its Compositions |
|---|---|---|---|---|---|
| F-12 | 1,2 | *p*-dichlorobenzene | Barrett (d)<br>Dow (d)<br>Monsanto (d)<br>Solvay (d) | C. fum<br>MP | Paracide<br>Paradow<br>Santochlor<br>PDB |
| F-13 | 1,2 | *o*-dichlorobenzene | Dow (d)<br>Monsanto (d)<br>Montrose (d)<br>Solvay (d) | C. fum. | ODB |
| F-14 | 1,2 | chloropicrin | Dow (d)<br>Larvacide (d) | C. fum.<br>S. fum. | Larvacide<br>Picfume |
| | 3 | chlorpicrin | | | |
| | 3 | nitrochloroform | | | |
| | 3 | trichloronitromethane | | | |
| F-15 | 1,2 | 1,1-dichloro-1-nitroethane | Comm. Solv. (c) | C. fum. | Ethide |
| F-16 | 1,2 | 3,4-dichlorotetrahydrothiophene-1-dioxide | Diamond Alkali (b) | Nem.<br>S. fum. | PRD |
| F-17 | 1,2 | 1,2-dibromo-3-chloropropane | Amer. Potash (d)<br>Dow (d)<br>Shell (d) | S. fum. | Fumazone<br>Nemafume<br>Nemagon<br>OS 1897 |
| F-18 | 1 | ethylene chlorobromide | Amer. Potash (Eston) (a)<br>Dow (c)<br>Westvaco (d) | Nem.<br>S. fum. | |
| | 2 | 1-bromo-2-chloroethane | | | |
| F-19 | 1 | methyl bromide | Amer. Potash (d)<br>Dow (d) | C. fum<br>S. fum. | Bromotox<br>$CH_3Br$ |
| | 2 | bromomethane | Kolker (d)<br>Mich. Chem. (d) | | MeBr |
| F-20 | 1 | ethylene dibromide | Amer. Potash (d)<br>Dow (d)<br>Westvaco (d) | C. fum.<br>Nem.<br>S. fum. | Bromofume<br>EDB |
| | 2 | 1,2-dibromoethane | | | |
| | 3 | ethylene bromide | | | |
| F-21 | 1,2 | sulfuryl fluoride | Dow (a) | C. fum. | Vikane |
| F-22 | 1,2 | isopropyl formate | Dow (a) | C. fum. | |
| F-23 | 1,2 | ethyl formate | Comm. Solv. (d) | C. fum. | |
| F-24 | 1,2 | ethylene oxide | Dow (d)<br>Olin-Math. (d)<br>Union Carbide (d) | C. fum. | ETO<br>Oxirane |
| | 3 | 1,2-epoxyethane | | | |
| F-25 | 1,2 | propylene oxide | Dow (d) | C. fum. | |
| | 3 | 1,2-epoxypropane | | | |
| F-26 | 1,2 | benzene | Barrett (d) | C. fum. | |
| F-27 | 1,2 | naphthalene | Barrett (d) | C. fum.<br>MP | |
| F-28 | 1 | hydrogen cyanide | Amer. Cyan. (d) | C. fum. | HCN<br>prussic acid (in $H_2O$) |
| | 2 | hydrocyanic acid | | | |
| F-29 | 1,2 | acrylonitrile | Amer. Cyan. (d) | C. fum. | VCN |
| | 3 | vinyl cyanide | | | |
| F-30 | 1,2 | carbon disulfide | Diamond Alkali (d)<br>Stauffer (d)<br>Westvaco (d) | C. fum. | $CS_2$ |
| | 3 | carbon bisulfide | | | |
| F-31 | 1,2 | sodium methyldithiocarbamate | Stauffer (d) | Nem.<br>S. fum. | N-869<br>Vapam |
| F-32 | 1,2 | sulfur dioxide | General Chem. (d)<br>Monsanto (d)<br>Olin-Math. (d) | C. fum. | $SO_2$ |

B & Z LIBRARY

## Heterocyclic Compounds

| Code | Authority | Chemical Name | Manufacturer of Chemical and Availability | Chemical Use | Other designations for Chemical and its Compositions |
|---|---|---|---|---|---|
| H-1 | 1,2 | phenothiazine | Dow (d)<br>DuPont (d) | Ins. | |
| H-2 | 1 | phenothioxin | Dow (a) | Ins. | |
| | 2 | phenoxathiin | | | |
| H-3 | 1,2 | nicotine | Diamond Black Leaf (d)<br>Tobacco By-Products (a) | Ins. | Black Leaf 40<br>Black Leaf 95<br>Black Leaf 99<br>nicotine (alkaloid)<br>nicotine (sulfate)<br>Nico-Fume Liquid |
| | 3 | *l*-1-methyl-2-(3-pyridyl)-pyrrolidine | | | |
| | 3 | *l*-3-(1-methyl-2-pyrrolidyl)-pyridine | | | |
| H-4 | 1 | dimethyl 5-(1-isopropyl-3-methylpyrazolyl) carbamate | Geigy (b) | Ins. | Isolan<br>G23611 |
| | 2 | 1-isopropyl-3-methyl-5-pyrazolyl dimethylcarbamate | | | |
| H-5 | 1 | dimethyl 5-(3-methyl-1-phenylpyrazolyl) carbamate | Geigy (b) | Ins. | Pyrolan<br>G22008 |
| | 2 | 3-methyl-1-phenyl-5-pyrazolyl dimethylcarbamate | | | |
| H-6 | 1 | 5,5-dimethyldihydroresorcinol dimethylcarbamate | Geigy (b) | Ins. | *dimetan*<br>G-19258 |
| | 3 | dimethyl-3-hydroxy-5,5-dimethyl-1-oxo-2-cyclohexenyl carbamate | | | |
| H-7 | 1,2 | 2-*n*-propyl-4-pyridinyl (6) dimethylcarbamate ? | Geigy (a) | Ins. | Pyramat<br>G23330 |
| H-8 | 1 | 2-hydroxy-2,4,4,7,4'-pentamethyl flavan | DuPont (a) | Acar. | Flavan<br>IN-531 |
| | 2 | 2,4,4,4',7-pentamethyl-2'-flavanol | | | |

## Miscellaneous Aryl Compounds

| | | | | | |
|---|---|---|---|---|---|
| M-1 | 1,2 | azobenzene | ? (?) | Acar. | *azobenzene* |
| | 3 | diphenyl diimide | | | |
| | 3 | azobenzide | | | |
| M-2 | 1 | di(4-chlorophenoxy) methane | Dow (c) | Acar. | Neotran<br>K-1875<br>DCPM |
| | 2 | bis(*p*-chlorophenoxy) methane | | | |
| M-3 | 1,2 | pentachlorophenol and its sodium salt | Dow (d)<br>Monsanto (d) | Ins. | Dowicide 7<br>Dowicide G<br>Santobrite |
| M-4 | 1,2 | *o*-phenylphenol and its sodium salt | Dow (d) | Acar. | Dowicide 1<br>Dowicide A |
| M-5 | 1 | styrene dibromide | Dow (b) | Ins. | Dowspray 9 |
| | 2 | (1,2-dibromoethyl) benzene | | | |
| | 3 | α,β-dibromoethylbenzene | | | |
| M-6 | 1,2 | phthalonitrile | Barrett (b) | Ins. | |
| M-7 | 1,2 | creosote | Barrett (d) | Ins. | Creosote oil |
| M-8 | 1 | dibenzo-gamma-pyrone | General Chem. (b) | Ins.<br>Acar. | Genicide<br>E-6 |
| | 2 | 9-xanthenone | | | |
| | 3 | xanthone | | | |

## Nitrophenyl Compounds and Derivatives

| Code | Authority | Chemical Name | Manufacturer of Chemical and Availability | Chemical Use | Other designations for Chemical and its Compositions |
|---|---|---|---|---|---|
| N-1 | 1,2 | 4,6-dinitro-*o*-cresol | Standard Agri. (d) | Ins. | *dinitrocresol*<br>DNOC<br>DNC<br>Elgetol<br>Sinox |
| | 3 | 2,4-dinitro-6-methylphenol | | | |
| N-2 | 1 | 4,6-dinitro-*o*-*sec*-butylphenol, triethanolamine salt | Dow (d)<br>Standard Agri. (d) | Ins. | *dinitrobutylphenol*<br>Dinoseb<br>DN-289<br>DNBP<br>DNOSBP<br>DNSBP<br>Elgetol 318 |
| | 2 | 2-*sec*-butyl-4,6-dinitrophenol 2,2′,2″-nitrilotriethanol salt | | | |
| N-3 | 1 | 4,6-dinitro-*o*-*sec*-butylphenol, sodium salt | Standard Agri. (d) | Ins. | *dinitrobutylphenol*<br>Dinoseb<br>DNBP<br>DNOSBP<br>DNSBP<br>Elgetol 30 |
| | 2 | 2-*sec*-butyl-4,6-dinitrophenol, sodium salt | | | |
| N-4 | 1 | 4,6-dinitro-*o*-cyclohexylphenol | Dow (d) | Acar.<br>Ins. | *dinitrocyclohexylphenol*<br>Dinex<br>DN-Dry Mix No. 1<br>DNOCHP |
| | 2 | 2-cyclohexyl-4,6-dinitrophenol | | | |
| N-5 | 1 | 4,6-dinitro-*o*-cyclohexylphenol N,N-dicyclohexylamine salt | Dow (d)<br>Pest Control (?) | Acar. | DN-111<br>Dynone II |
| | 2 | 2-cyclohexyl-4,6-dinitrophenol dicyclohexylamine salt | | | |
| N-6 | 1 | dinitro (1-methyl heptyl) phenyl crotonate | Rohm and Haas (d) | Acar. | Karathane<br>Arathane<br>Iscothane<br>CR-1639 |
| | 2 | 2-(1-methylheptyl)-4,6-dinitrophenyl crotonate | | | |
| | 3 | 2-capryl-4,6-dinitrophenyl crotonate | | | |

## Phosphorus-Containing Compounds

| | | | | | |
|---|---|---|---|---|---|
| P-1 | 1 | tetraethyl pyrophosphate | Amer. Potash (d)<br>Monsanto (a)<br>Victor (a)<br>Westvaco (d) | Ins. | *TEPP*<br>TEP<br>Tetron |
| | 2 | ethyl pyrophosphate, approx. 40% technical | | | |
| P-2 | 1 | hexaethyl tetraphosphate (contains 10-20% TEPP) | Monsanto (a) | Ins. | *HETP*<br>Bladan<br>Nifos |
| | 2 | mixture of ethyl polyphosphates containing 10-20% ethyl pyrophosphate | | | |
| P-3 | 1,2 | tetra-*n*-propyl dithionopyrophosphate | DuPont (a) | Acar.<br>Ins. | NPD<br>A-42<br>E-8573 |

PHOSPHORUS-CONTAINING COMPOUNDS—continued

| Code | Authority | Chemical Name | Manufacturer of Chemical and Availability | Chemical Use | Other designations for Chemical and its Compositions |
|---|---|---|---|---|---|
| P-4 | 1 | tetraethyl dithiopyrophosphate | Monsanto (a)<br>Victor (a) | Acar.<br>Ins. | *sulfotepp*<br>ASP-47<br>dithione<br>Sulfatep<br>TEDTP |
| | 2 | O,O,O,O-tetraethyl dithiopyrophosphate | | | |
| | 3 | ethyl thiopyrophosphate | | | |
| P-5 | 1 | O,O-dimethyl dithiophosphate of diethyl mercaptosuccinate | Amer. Cyan. (d) | Ins. | *malathion*<br>Malathon<br>4049 |
| | 2 | malathion | | | |
| | 3 | O,O-dimethyl S-(1,2-dicarbethoxyethyl) dithiophosphate | | | |
| | 3 | S-[1,2-bis(ethoxycarbonyl)-ethyl] O,O-dimethyl phosphorodithioate | | | |
| | 3 | O,O-dimethyl phosphorodithioate ester with diethyl mercaptosuccinate | | | |
| P-6 | 1 | 1-methoxycarbonyl-1-propen-2-yl dimethyl phosphate, 60% technical | Shell (c) | Ins.<br>Sys. | Phosdrin<br>OS 2046 |
| | 2 | 2-methoxycarbonyl-1-methylvinyl dimethyl phosphate | | | |
| | 3 | 1-carbomethoxy-1-propen-2-yl dimethyl phosphate | | | |
| | 3 | O,O-dimethyl 1-carbomethoxy-1-propen-2-yl phosphate | | | |
| P-7 | 1 | O,O-diethyl O(and S)-2-(ethylthio)ethylphosphorodithioates | Bayer (?)<br>Chemagro (d)<br>Pitts. Coke and Chem. (a) | Acar.<br>Ins.<br>Sys. | *demeton*<br>Systox<br>E-1059<br>8173 |
| | 2 | O,O-diethyl S-(2-ethylthio) ethyl phosphorodithionate mixture with O,O-diethyl O-(2-ethylthio)ethyl phosphorodithionate | | | |
| | 3 | mixture of O,O-diethyl-S-ethylmercaptoethyl thiophosphate and O,O-diethyl-O-ethylmercaptoethyl thiophosphate | | | |
| | 3 | a trialkyl thiophosphate | | | |
| P-8 | 1 | O,O-dimethyl O(and S)(2-ethylthio)ethyl phosphorothioates | Bayer (?)<br>Chemagro (a)<br>Pitts. Coke and Chem (a) | Acar.<br>Ins.<br>Sys. | *methyl demeton*<br>meta-Systox<br>Methyl Systox<br>21/116 |
| | 2 | O,O-dimethyl S-(2 ethylthio) ethyl phosphorodithionate mixture with O,O-dimethyl O-(2 ethylthio)ethyl phosphorodithionate | | | |
| | 3 | mixture of O,O-dimethyl-S-ethylmercaptoethyl thiophosphate and O,O-dimethyl-O-ethylmercaptoethyl thiophosphate | | | |
| P-9 | 1,2 | O,O-diethyl S-(isopropylthiomethyl) phosphorodithioate | Amer. Cyan. (b) | Acar.<br>Ins.<br>Sys. | Amer. Cyan. 12008 |
| | 3 | O,O-diethyl (S-isopropylmercaptomethyl) dithiophosphate | | | |

PHOSPHORUS-CONTAINING COMPOUNDS—continued

| Code | Authority | Chemical Name | Manufacturer of Chemical and Availability | Chemical Use | Other designations for Chemical and its Compositions |
|---|---|---|---|---|---|
| P-10 | 1,2 | O,O-diethyl S-(ethylthiomethyl) phosphorodithioate | Amer. Cyan. (c) | Acar.<br>Ins.<br>Sys. | Thimet<br>L 11/6<br>3911 |
| | 3 | O,O-diethyl (S-ethylmercaptomethyl) dithiophosphate | | | |
| P-11 | 1,2 | O,O-diethyl S-(*n*-propylthiomethyl) phosphorodithioate | Amer. Cyan. (a) | Acar.<br>Ins.<br>Sys. | Amer. Cyan. 12009 |
| | 3 | O,O-diethyl S-n-propylmercaptomethyl dithiophosphate | | | |
| P-12 | 1,2 | O,O-diisopropyl S-(isopropylthiomethyl) phosphorodithioate | Amer. Cyan. (c) | Acar.<br>Ins.<br>Sys. | Amer. Cyan. 12013 |
| | 3 | O,O-diisopropyl S-isopropylmercaptomethyl dithiophosphate | | | |
| P-13 | 1,2 | O,O-diethyl S-2(ethylthio)-ethyl phosphorothioate | Bayer (?)<br>Chemagro (b) | Acar.<br>Ins.<br>Sys. | Bayer 19639<br>Di-Syston |
| P-14 | 1 | 2-carbethoxy-1-methylvinyl diethyl phosphate | Shell (a) | Ins. | OS1808 |
| | 2 | 2-ethoxycarbonyl-1-methylvinyl diethyl phosphate | | | |
| P-15 | 1,2 | bis(dialkoxyphosphinothioyl) disulfides (alkyl ratio 25% isopropyl, 75% ethyl) | Niagara (b) | Ins. | Phostex<br>Niagara 1137 |
| P-16 | 1,2 | dimethyl (2,2,2-trichloro-1-hydroxyethyl) phosphonate | Bayer (?)<br>Chemagro (d) | Ins. | Dipterex<br>Bayer L13/59<br>Dylox |
| P-17 | 1 | O,O-diethyl 2-chlorovinyl phosphate | Shell (a) | Ins.<br>Sys. | Shell OS 1836 |
| | 2 | 2-chlorovinyl diethyl phosphate | | | |
| P-18 | 1 | O,O-dimethyl 2,2-dichlorovinyl phosphate | Montrose (c) | C. fum.<br>Ins. | DDVP |
| | 2 | 2,2-dichlorovinyl dimethyl phosphate | | | |
| P-19 | 1,2 | [2-(diethoxyphosphinylthio)-ethyl]ethylmethylsulfonium methyl sulfate | Bayer (?) | ? | Bayer 28/63 |
| P-20 | 1 | bis(dimethylamino) fluorophosphine oxide | Murphy (d)<br>Pest Control (?) | Acar.<br>Ins.<br>Sys. | *dimefox*<br>DMF<br>Hanane<br>Pestox 14<br>Terra Systam |
| | 2 | tetramethylphosphorodiamidic fluoride | | | |
| P-21 | 1 | bis(dimethylamino) phosphoric anhydride | Monsanto (a)<br>Murphy (d)<br>Pest Control (d) | Acar.<br>Ins.<br>Sys. | *schradan*<br>OMPA<br>Pestox III<br>Systam |
| | 2 | octamethylpyrophosphoramide | | | |
| P-22 | 1 | N,N'-diisopropyldiamidophosphoryl fluoride | Pest Control (?) | Ins.<br>Sys. | Isopestox<br>mipafox<br>Pestox 15 |
| | 2 | N,N'-diisopropylphosphorodiamidic fluoride | | | |
| P-23 | 1,2 | O,O-dimethyl S-(2-oxo-2-ureidoethyl) phosphorodithioate | Amer. Cyan. (b) | Acar.<br>Ins.<br>Sys. | 3901 |
| | 3 | O,O-dimethyl S-α-mercaptoacetylurea dithiophosphate | | | |

| Code | Authority | Chemical Name | Manufacturer of Chemical and Availability | Chemical Use | Other Designations for Chemical and its Compositions |
|---|---|---|---|---|---|
| P-24 | 1,2 | S-carbamylmethyl O,O-dimethyl phosphorodithioate | Amer. Cyan. (a) | Ins. Sys. | 3869 |
| | 3 | S-carbamylmethyl O,O-dimethyl dithiophosphate | | | |
| P-25 | 1 | diisopropyl ester of diethyl dithiocarbamyl phosphorothioic acid | Holcomb (a) | Acar. Ins. | Holcomb Cmpd. 326<br>ENT-24,725 |
| | 2 | S-diethylthiocarbamoyl O,O-diisopropyl phosphorothioate | | | |
| | 3 | O,O-diisopropyl dithiophosphoric acid ester of N,N-diethyldithiocarbamic anhydrosulfide | | | |
| | 3 | N,N-diethylthiocarbamyl O,O-diisopropyl dithiophosphate | | | |
| P-26 | 1 | O,O-diethyl S-(β-diethylamino) ethyl phosphorothiolate hydrogen oxalate | Chipman (c) | Acar. Ins. | Chipman R-6199<br>Tetram<br>Hydrogen oxalate of Amitate |
| | 2 | S-(2-diethylaminoethyl) O,O-diethyl phosphorothioate hydrogenoxalate | | | |
| P-27 | 1,2 | O,O-diethyl S-(N-isopropylcarbamoylmethyl) phosphorodithioate | Amer. Cyan. (?) | Ins. | Amer. Cyan. 18682 |
| P-28 | 1 | O,O-diethyl O-*p*-nitrophenyl phosphorothioate | Amer. Cyan. (d)<br>Amer. Potash (d)<br>Bayer (?)<br>Monsanto (d)<br>Pitts. Coke and Chem. (a) | Acar. Ins. | *parathion*<br>Alkron<br>Niran<br>Thiophos<br>Amer. Cyan. 3422<br>E-605 |
| | 2 | parathion | | | |
| | 3 | O,O-diethyl O-*p*-nitrophenyl thiophosphate | | | |
| | 3 | diethyl *p*-nitrophenyl thionophosphate | | | |
| P-29 | 1,2 | O,O-dimethyl O-*p*-nitrophenyl phosphorothioate and parathion mixture | Bayer (?)<br>Chemagro (d)<br>Pitts. Coke and Chem. (a) | Acar. Ins. | Metacide<br>Gearphos |
| | 3 | O,O-dimethyl O-*p*-nitrophenyl thiophosphate and parathion mixture | | | |
| P-30 | 1,2 | O,O-dimethyl O-*p*-nitrophenyl phosphorothioate | Amer. Cyan. (d)<br>Chemagro (d)<br>Monsanto (d)<br>Victor (d) | Ins. | *methyl parathion*<br>methyl homologue of parathion<br>Nitrox<br>E601 |
| | 3 | O,O-dimethyl O-*p*-nitrophenyl thiophosphate | | | |
| | 3 | dimethyl *p*-nitrophenyl thionophosphate | | | |
| P-31 | 1 | O,O-diethyl O-*p*-nitrophenyl-phosphate | Bayer (?) | Ins. | *para-oxon*<br>oxygen analogue of parathion<br>E-600 |
| | 2 | diethyl *p*-nitrophenyl phosphate | | | |
| P-32 | 1,2 | O,O-diisopropyl O-*p*-nitrophenyl phosphorothioate | Amer. Cyan. (?) | Ins. | diisopropyl parathion<br>3456 |
| | 3 | O,O-diisopropyl O-*p*-nitrophenyl thiophosphate | | | |

PHOSPHORUS-CONTAINING COMPOUNDS—continued

| Code | Authority | Chemical Name | Manufacturer of Chemical and Availability | Chemical Use | Other Designations for Chemical and its Compositions |
|---|---|---|---|---|---|
| P-33 | 1,2 | O-(2-chloro-4-nitrophenyl) O,O-dimethyl phosphorothioate | Amer. Cyan. (b) | Acar. Ins. | Amer. Cyan. 4124 |
| | 3 | O,O-dimethyl O-(2-chloro-4-nitrophenyl) thiophosphate | | | |
| P-34 | 1 | O,O-dimethyl O-(3-chloro-4-nitrophenyl) thiophosphate | Bayer (?) Chemagro (a) | Ins. | Chlorthion Bayer 22/190 |
| | 2 | O-(3-chloro-4-nitrophenyl) O,O-dimethyl phosphorothioate | | | |
| P-35 | 1 | O,O-diethyl O-2,4-dichlorophenyl phosphorothioate | Virginia-Carolina (d) | Acar. Ins. Nem. | V-C 1-13 |
| | 2 | O-2,4-dichlorophenyl O,O-diethyl phosphorothioate | | | |
| | 3 | O,O-diethyl O-2,4-dichlorophenyl thiophosphate | | | |
| P-36 | 1,2 | O,O-dimethyl O-2,4,5-trichlorophenyl phosphorothioate | Dow (b) | Ins. | Dow ET-57 Dow ET-14 Korlan Viozene |
| P-37 | 1,2 | O-methyl O-2,4,5-trichlorophenyl phosphoroamidothioate | Dow (a) | Ins. | Dow ET-15 |
| P-38 | 1 | ethyl *p*-nitrophenyl benzene thiophosphonate | DuPont (d) | Acar. Ins. | EPN EPN-300 |
| | 2 | O-ethyl O-*p*-nitrophenyl phenylphosphonothioate | | | |
| | 3 | O-ethyl O-*p*-nitrophenyl-benzenethiophosphonate | | | |
| P-39 | 1,2 | S-(*p*-chlorophenylthiomethyl) O,O-diethyl phosphorodithioate | Stauffer (c) | Acar. Ins. | Trithion R1303 |
| | 3 | O,O-diethyl p-chlorophenylmercaptomethyl dithiophosphate | | | |
| P-40 | 1,2 | (3,4-dichlorobenzyl) triphenylphosphonium chloride | General Dyestuff (d) | MP | Eulan NK Eulan NKU |
| P-41 | 1 | 4-methylumbelliferone O,O-diethyl thiophosphate | Bayer (?) | Ins. | Potasan E-838 |
| | 2 | O,O-diethyl O-(4-methylumbelliferone) phosphorothioate | | | |
| | 3 | O,O-diethyl O-(2-oxo-1, 2H-benzopyran-7-yl) thiophosphate | | | |
| | 3 | O,O-diethyl thiophosphoric acid ester of 7-hydroxy-4-methylcoumarin | | | |
| P-42 | 1 | 4-methylumbelliferone O,O-dimethyl thiophosphate | Bayer (?) | Ins. | Methyl Potasan |
| | 2 | O,O-dimethyl O-(4-methylumbelliferone) phosphorothioate | | | |
| | 3 | O,O-dimethyl O-(2-oxo-1-2H-benzopyran-7-yl) thiophosphate | | | |
| P-43 | 1 | 3-chloro-4-methylumbelliferone, O,O-diethyl thiophosphate | Bayer (?) Chemagro (b) | Ins. | Bayer 21/199 |
| | 2 | O-(3-chloro-4-methylumbelliferone) O,O-diethyl phosphorothioate | | | |

| Code | Authority | Chemical Name | Manufacturer of Chemical and Availability | Chemical Use | Other designations for Chemical and its Compositions |
|---|---|---|---|---|---|
| P-44 | 1 | 3-chloro-4-methylumbelliferone O,O-dimethyl thiophosphate | Bayer (?) | Ins. | Bayer 21/200 |
| | 2 | O-(3-chloro-4-methylumbelliferone) O,O-dimethyl phosphorothioate | | | |
| P-45 | 1,2 | 2,3-*p*-dioxanedithiol S,S-bis(O,O-diethyl phosphorodithioate) | Hercules (b) | Acar. Ins. | Hercules AC-528 Navadel |
| P-46 | 1 | O,O-diethyl O-(2-isopropyl-6-methyl-4-pyrimidyl) thiophosphate | Geigy (d) | Acar. Ins. | Diazinon Basudin G-24480 |
| | 2 | O,O-diethyl O-(2-isopropyl-6-methyl-4-pyrimidinyl) phosphorothioate | | | |
| P-47 | 1 | O,O-diethyl O-3-(2-propyl-6-methyl-4-pyrimidinyl)-thiophosphate | Geigy (a) | Ins. | Pirazinon Pyrazinon G-24622 |
| | 2 | O,O-diethyl O-3-(6-methyl-2-propyl-4-pyrimidinyl)-phosphorothioate | | | |
| P-48 | 1 | O,O-diethyl O-(3-methyl-5-pyrazolyl) phosphate | Geigy (a) | Ins. | Pyrazoxon G 24483 |
| | 2 | diethyl 3-methyl-5-pyrazolyl phosphate | | | |
| P-49 | 1 | O,O-diethyl O-3-methylpyrazolyl (5) thiophosphate | Geigy (a) | Ins. | Pyrazothion G 23027 |
| | 2 | O,O-diethyl O-3-methyl-5-pyrazolyl phosphorothioate | | | |
| P-50 | 1 | O,O-dimethyl S-(4-oxo-3H-1,2,3-benzotriazine-3-methyl)-phosphorodithioate | Bayer (?) Chemagro (c) | Ins. | Guthion Gusathion Bayer 17147 17/147 |
| | 2 | S-(3,4-dihydro-4-oxo-1,2,3-benzotriazin-3-ylmethyl) O,O-dimethyl phosphorodithioate | | | |
| | 3 | benzotriazine derivative of a methyl dithiophosphate | | | |
| P-51 | 1 | O,O-diethyl S-(4-oxo-3H-1,2,3-benzotriazine-3-methyl) phosphorodithioate | Bayer (?) | Ins. | Bayer 16259 |
| | 2 | S-(3,4-dihydro-4-oxo-1,2,3-benzotriazin-3-ylmethyl) O,O-diethyl phosphorodithioate | | | |
| | 3 | benzotriazine derivative of an ethyl dithiophosphate | | | |
| P-52 | 1 | O,O-diethyl O-[6-(3(2H)-pyridazinonyl)] phosphorothioate | Amer. Cyan. (?) | Ins. | Amer. Cyan. 12415 |
| | 2 | O-(1,6-dihydro-6-oxopyridazin-3-yl) O,O-diethyl phosphorothioate | | | |
| P-53 | 1 | O,O-dimethyl O-[6(3(2H)-pyridazinonyl)] phosphorothioate | Amer. Cyan. (?) | Ins. | Amer. Cyan. 12433 |
| | 2 | O-(1,6-dihydro-6-oxopyridazin-3-yl) O,O-dimethyl phosphorothioate | | | |
| P-54 | 1 | O,O-diethyl O-[6-(3(2-phenyl)-pyridazinonyl)] phosphorothioate | Amer. Cyan. (?) | Ins. | Amer. Cyan. 12503 |
| | 2 | O-(1,6-dihydro-6-oxo-1-phenylpyridazin-3-yl) O,O-diethyl phosphorothioate | | | |

| Code | Authority | Chemical Name | Manufacturer of Chemical and Availability | Chemical Use | Other Designations for Chemical and its Compositions |
|---|---|---|---|---|---|
| R-1 | 1,2 | 2-ethyl-1,3-hexanediol | Union Carbide (d) | RP | *ethyl hexanediol*<br>Rutgers 612<br>"6-12" |
| R-2 | 1,2 | 2-butyl-2-ethyl-1,3-propanediol | Montrose (d)<br>Union Carbide (d) | RP | BEP |
| R-3 | 1,2 | 2-phenylcyclohexanol and 2-cyclohexylcyclohexanol mixture | Dow (c) | RP | NMRI-201<br>448 |
| R-4 | 1 | butoxy polypropylene glycol | Union Carbide (d) | Acar.<br>RP | *butoxy polypropylene glycol* |
| | 2 | butoxypropanediol polymer | | | Crag Fly Repellent |
| | 3 | polypropylene glycol butyl ether | | | Exp. Miticide No. 7 |
| R-5 | 1 | Diethylene glycol mono butyl ether acetate | Union Carbide (a) | RP | Sta-way |
| | 2 | 2-(2-butoxyethoxy)ethyl acetate | | | |
| R-6 | 1,2 | dimethyl cis-bicyclo-[2.2.1]-5-heptene-2,3-dicarboxylate | Union Carbide (d) | RP | *dimethyl carbate*<br>3916 |
| R-7 | 1,2 | butyl 3,4-dihydro-2,2-dimethyl-4-oxo-2H-pyran-6-carboxylate | Fairfield (d)<br>Kilgore (a)<br>U.S. Industrial (a) | RP | Indalone<br>butopyronoxyl |
| | 3 | 2,2-dimethyl-6-carbobutoxy-2,3-dihydro-4-pyrone | | | |
| | 3 | *n*-butyl mesityl oxide oxalate | | | |
| R-8 | 1,2 | di-*n*-butyl adipate | Union Carbide (b) | RP | Exp. Tick Rep. 3PS |
| R-9 | 1,2 | di-*n*-butyl phthalate | Barrett (d)<br>Comm. Solv. (d)<br>Monsanto (d)<br>Montrose (d) | RP | DBP |
| | 3 | dibutyl phthalate | | | |
| R-10 | 1,2 | dimethyl phthalate | Barrett (d)<br>Monsanto (d) | RP | DMP |
| R-11 | 1,2 | benzyl benzoate | Monsanto (d)<br>Montrose (d) | RP | |
| R-12 | 1,2 | di-*n*-propyl isocinchomeronate | M.G.K. (c) | RP | MGK Repellent 326<br>R-326 |
| R-13 | 1,2 | dibutyl succinate | Glenn (d) | RP | Tabutrex |
| R-14 | 1,2 | N-butylacetanilide | Dow (a)<br>Montrose (d)<br>Union Carbide (d) | RP | BAA |
| R-15 | 1,2 | N,N-diethyl-*m*-toluamide | Hercules (d)<br>Montrose (c) | RP | Delphene<br>M-DET<br>20218 |
| R-16 | 1,2 | N,N-diethyl-*o*-toluamide | Montrose (c) | RP | O-DET |
| R-17 | 1,2 | *o*-chloro-N,N-diethylbenzamide | Geigy (b) | RP | Kik<br>G-18359 |
| R-18 | 1 | 2,3,4,5-bis(△2-butylene) tetrahydrofurfural | M.G.K. (d) | RP | MGK Repellent 11<br>R-11 |
| | 2 | 1,5a,6,9,9a,9b-hexahydro-4a(4H)-dibenzofurancarboxaldehyde | | | |

| Code | Authority | Chemical Name | Manufacturer of Chemical and Availability | Chemical Use | Other Designations for Chemical and its Compositions |
|---|---|---|---|---|---|
| S-1 | 1,2 | *p*-chlorophenyl *p*-chlorobenzenesulfonate | Amer. Potash<br>Eston (a)<br>Diamond Alkali (d)<br>Dow (d)<br>Murphy (d) | Acar. | *ovex*<br>CPCBS<br>Chlorfensone<br>Estonmite<br>Miticide K-101<br>Ovochlor<br>Ovotran<br>K-6,451<br>C-854<br>C-1006 |
| S-2 | 1 | 2,4-dichlorophenyl ester of benzenesulfonic acid | General Chem. (d) | Acar. | Genite<br>Genitol 923<br>923 |
| | 2 | 2,4-dichlorophenyl benzenesulfonate | | | |
| | 3 | dichlorophenyl benzenesulfonate | | | |
| S-3 | 1,2 | *p*-chlorophenyl benzenesulfonate | General Chem. (b)<br>Murphy (d) | Acar. | CPBS<br>Fensone<br>Murvesco<br>PCPBS<br>928 |
| S-4 | 1,2 | *p*-chlorophenyl phenyl sulfone and related sulfones | Stauffer (d) | Acar. | Sulphenone<br>R-242 |
| S-5 | 1,2 | *p*-chlorophenyl 2,4,5-trichlorophenyl sulfone | Niagara (b) | Acar. | Tedion<br>Tedion V-18 |
| | 3 | 2,4,4',5-tetrachlorodiphenyl sulfone (80% technical) | | | |
| S-6 | 1,2 | chloromethyl *p*-chlorophenyl sulfone | German (?) | Ins. | *lauseto neu* |
| S-7 | 1,2 | *p*-chlorobenzyl *p*-chlorophenyl sulfide | Boots Pure Drug (d) | Acar. | Chlorbenside<br>Chlorparacide<br>Chlorsulphacide<br>Mitox |
| S-8 | 1,2 | lauryl 2-thiazolinyl sulfide | DuPont (a) | Acar. | L-2TS<br>IN-4200 |
| S-9 | 1,2 | *p*-chlorobenzyl *p*-fluorophenyl sulfide | Boots Pure drug (b) | Acar. | HRS 942 |
| S-10 | 1 | 2-(*p*-tert-butylphenoxy)-isopropyl 2-chloroethyl sulfite | Naugatuck (d) | Acar. | Aramite<br>alkyl aryl sulfite<br>88R |
| | 2 | 2-(*p*-tert-butylphenoxy)-1-methylethyl 2-chloroethyl sulfite | | | |
| | 3 | β-chloroethyl β-(p-tert-butylphenoxy)-α-methylethyl sulfite | | | |
| S-11 | 1,2 | 3,4-dichloro-4'-nitrobenzenesulfonanilide | Rohm and Haas (a) | Ins. | HE-761 |
| | 3 | 3,4-dichlorobenzene-sulfon-4-nitroanilide | | | |
| S-12 | 1,2 | 3,4-dichloro-N-methylbenzenesulfonamide | General Dyestuff (?) | Ins.<br>MP | Eulan BL |
| S-13 | 1 | 2,2'-dihydroxy-3,5,3',5'-tetrachlorotriphenylmethane-2"-sodium sulfonate | General Dyestuff (d) | MP | Eulan CN (New) |
| | 2 | sodium α,α-bis(3,5-dichloro-2-hydroxyphenyl)-o-toluenesulfonate | | | |

SULFONATES, SULFIDES, SULFONES, SULFONAMIDES, SULFITES—continued

| Code | Authority | Chemical Name | Manufacturer of Chemical and Availability | Chemical Use | Other designations for Chemical and its Compositions |
|---|---|---|---|---|---|
| S-14 | 1 | 2,2′-dihydroxy-3,5,3′,5′,4″-pentachlorotriphenylmethane 2″-sodium sulfonate | General Dyestuff (?) | MP | Eulan CN |
| | 2 | sodium 5-chloro-α,α-bis-(3,5-dichloro-2-hydroxyphenyl) o-toluenesulfonate | | | |
| S-15 | 1 | sodium salt of N-(3,4-dichlorophenyl)-N′-2(2-sulfo-4-chlorophenoxy)-5-chlorophenyl urea | Geigy (d) | MP | Mitin FF |
| | 2 | sodium 5-chloro-2-(4-chloro-2-(3-(3,4-dichlorophenyl)-ureido) phenoxy) benzenesulfonate | | | |
| | 3 | N-3,4-dichlorophenyl N′-5-chloro-2-(2-sodium sulfonyl-4-chlorophenoxy) phenyl urea | | | |

THIOCYANATES

| Code | Authority | Chemical Name | Manufacturer of Chemical and Availability | Chemical Use | Other Designations for Chemical and Its Compositions |
|---|---|---|---|---|---|
| T-1 | 1 | β-thiocyanoethyl laurate (coconate) | Rohm and Haas (d) | Ins. | Lethane 60 |
| | 2 | 2-thiocyanoethyl laurate | | | |
| T-2 | 1 | β,β′-dithiocyano diethyl ether | Rohm and Haas (d) | Ins. | Lethane A-70 |
| | 2 | diethylene glycol dithiocyanate | | | |
| | 3 | bis(2-thiocyanoethyl) ether | | | |
| T-3 | 1 | β-butoxy-β′-thiocyanodiethyl ether | Rohm and Haas (d) | Ins. | Lethane 384 |
| | 2 | 2-(2-butoxyethoxy) ethyl thiocyanate | | | |
| | 3 | butyl carbitol rhodanate | | | |
| | 3 | butyl carbitol thiocyanate | | | |
| T-4 | 1,2 | n-dodecyl thiocyanate | DuPont (a) | Ins. | Loro "Lorol thiocyanate" |
| | 3 | lauryl rhodanate | | | |
| T-5 | 1,2 | isobornyl thiocyanoacetate —82% other related terpenes—18% | Hercules (d) | Ins. | Thanite |
| | 3 | terpinyl thiocyanoacetate | | | |
| | 3 | mixture of fenchyl and isobornyl thiocyanoacetates | | | |

| Name | Chemical Classification Code |
|---|---|
| *aldrin* | C-7 |
| Alkron | P-28 |
| alkyl aryl sulfite | S-10 |
| *allethrin* | B-5 |
| allyl homologue of Cinerin I | B-5 |
| Amer. Cyan. 3422 | P-28 |
| Amer. Cyan. 4124 | P-33 |
| Amer. Cyan. 12008 | P-9 |
| Amer. Cyan. 12009 | P-11 |
| Amer. Cyan. 12013 | P-12 |
| Amer. Cyan. 12415 | P-52 |
| Amer. Cyan. 12433 | P-53 |
| Amer. Cyan. 12503 | P-54 |
| Amer. Cyan. 18682 | P-27 |
| Aramite | S-10 |
| Arathane | N-6 |
| *azobenzene* | M-1 |
| Basudin | P-46 |
| Bayer L13/59 | P-16 |
| Bayer 21/199 | P-43 |
| Bayer 21/200 | P-44 |
| Bayer 22/190 | P-34 |
| Bayer 28/63 | P-19 |
| Bayer 16259 | P-51 |
| Bayer 17147 | P-50 |
| Bayer 19639 | P-13 |
| Black Leaf 40 | H-3 |
| Black Leaf 95 | H-3 |
| Black Leaf 99 | H-3 |
| Bladan | P-2 |
| Bromofume | F-20 |
| Bromotox | F-19 |
| Bulan | D-7 |
| butopyronoxyl | R-7 |
| *butoxy polypropylene glycol* | R-4 |
| Chipman R-6199 | P-26 |
| Chlorbenside | S-7 |
| Chlorbenzilate | D-15 |
| *chlordane* | C-3 |
| Chlorex | F-11 |
| Chlorfensone | S-1 |
| Chlorophenothene | D-1 |
| Chlorothene | F-4 |
| Chlorparacide | S-7 |
| Chlorsulphacide | S-7 |
| Chlorthion | P-34 |
| compound 118 | C-7 |
| compound 269 | C-10 |
| compound 497 | C-9 |
| compound 711 | C-8 |
| compound 3961 | C-6 |
| Crag Fly Repellent | R-4 |
| creosote oil | M-7 |
| cyclethrin | B-6 |
| D-D mixture | F-7 |
| Delphene | R-15 |
| *demeton* | P-7 |
| derris | B-1 |
| Diazinon | P-46 |
| *dieldrin* | C-9 |
| diisopropyl parathion | P-32 |
| Dilan | D-5 |
| *dimefox* | P-20 |
| *dimetan* | H-6 |
| dimethyl carbate | R-6 |
| Dimite | D-14 |
| Dinex | N-4 |
| *dinitrobutylphenol* | N-2, N-3 |
| *dinitrocresol* | N-1 |
| *dinitrocyclohexylphenol* | N-4 |
| Dinoseb | N-2, N-3 |
| Dipterex | P-16 |
| Di-Syston | P-13 |
| Dithione | P-4 |
| DN-Dry Mix No. 1 | N-4 |
| Dow ET-14 | P-36 |
| Dow ET-15 | P-37 |
| Dow ET-57 | P-36 |
| Dowfume N | F-7 |
| Dowicide A | M-4 |
| Dowicide G | M-3 |
| Dowicide 1 | M-4 |
| Dowicide 7 | M-3 |
| Dowspray 9 | M-5 |
| Dylox | P-16 |
| Dynone II | N-5 |
| Elgetol | N-1 |
| Elgetol 30 | N-3 |
| Elgetol 318 | N-2 |
| *endrin* | C-10 |
| Estonmite | S-1 |
| Ethide | F-15 |
| *ethyl hexanediol* | R-1 |
| Etoxinol | D-18 |
| Eulan BL | S-12 |
| Eulan CN | S-14 |
| Eulan CN (New) | S-13 |
| Eulan NK | P-40 |
| Eulan NKU | P-40 |
| Exp. Miticide No. 7 | R-4 |
| Exp. Tick Repellent 3PS | R-8 |
| Fensone | S-3 |
| Flavan | H-8 |
| Fumazone | F-17 |
| gamma BHC | C-2 |
| gammexane | C-1 |
| Gearphos | P-29 |
| Geigy 337 | D-18 |
| Geigy 338 | D-15 |
| Genicide | M-8 |
| Genite | S-2 |
| Genitol 923 | S-2 |
| Gusathion | P-50 |
| Guthion | P-50 |
| Hanane | P-20 |
| *heptachlor* | C-4 |
| Hercules AC-528 | P-45 |
| Holcomb compound 326 | P-25 |
| Hydrogen oxalate of Amitate | P-26 |
| Indalone | R-7 |
| Iscothane | N-6 |
| isobornyl thiocyanoacetate | T-5 |
| *isodrin* | C-8 |
| Isolan | H-4 |
| Isopestox | P-22 |
| Karathane | N-6 |
| Kelthane | D-16 |
| Kik | R-17 |
| Korlan | P-36 |
| Larvacide | F-14 |
| *lauseto neu* | S-6 |
| Lethane 60 | T-1 |
| Lethane 384 | T-3 |
| Lethane A-70 | T-2 |
| *lindane* | C-2 |
| Loro | T-4 |
| "Lorol thiocyanate" | T-4 |

| Name | Chemical Classification Code |
|---|---|
| *malathion* | P-5 |
| Malathon | P-5 |
| Malix | C-14 |
| Marlate | D-4 |
| Metacide | P-29 |
| meta Systox | P-8 |
| *methoxychlor* | D-4 |
| Methoxy DDT | D-4 |
| *methyl demeton* | P-8 |
| methyl homologue of parathion | P-30 |
| *methyl parathion* | P-30 |
| Methyl Potasan | P-42 |
| Methyl Systox | P-8 |
| MGK Repellent 11 | R-18 |
| MGK Repellent 326 | R-12 |
| mipafox | P-22 |
| Miticide K-101 | S-1 |
| Mitin FF | S-15 |
| Mitox | S-7 |
| Murvesco | S-3 |
| Navadel | P-45 |
| Nemafume | F-17 |
| Nemagon | F-17 |
| Neotran | M-2 |
| Niagara 1137 | P-15 |
| Nico-Fume Liquid | H-3 |
| nicotine (alkaloid) | H-3 |
| nicotine (sulfate) | H-3 |
| Nifos | P-2 |
| Niran | P-28 |
| Nitrox | P-30 |
| Octachlor | C-3 |
| Octacide 264 | A-8 |
| Octaklor | C-3 |
| Octalene | C-7 |
| Octalox | C-9 |
| *ovex* | S-1 |
| Ovochlor | S-1 |
| Ovotran | S-1 |
| Oxirane | F-24 |
| oxygen analogue of parathion | P-31 |
| Paracide | F-12 |
| Paradow | F-12 |
| *para-oxon* | P-31 |
| *parathion* | P-28 |
| Perthane | D-9 |
| Pestox III | P-21 |
| Pestox 14 | P-20 |
| Pestox 15 | P-22 |
| Phosdrin | P-6 |
| *Phostex* | P-15 |
| Picfume | F-14 |
| *piperonyl butoxide* | A-1 |
| piperonyl cyclohexanone | A-2 |
| *piperonyl cyclonene* | A-2 |
| Pirazinon | P-47 |
| Pivalyl Valone | A-11 |
| Potasan | P-41 |
| Prolan | D-6 |
| *propyl isome* | A-3 |
| n-propyl isome | A-3 |
| prussic acid (in $H_2O$) | F-28 |
| Pyramat | H-7 |
| Pyrazinon | P-47 |
| Pyrazothion | P-49 |
| Pyrazoxon | P-48 |
| pyrethrin I | B-4 |
| pyrethrin II | B-4 |
| pyrethrum | B-4 |
| Pyrolan | H-5 |
| Rhothane | D-2 |
| rotenone | B-1 |
| Rutgers 612 | R-1 |
| ryania | B-3 |
| sabadilla | B-2 |
| Santobrite | M-3 |
| Santochlor | F-12 |
| *schradan* | P-21 |
| *sesamin* | A-4 |
| *sesamolin* | A-5 |
| Sesoxane | A-6 |
| Shell OS 1836 | P-17 |
| Sinox | N-1 |
| Sta-way | R-5 |
| Strobane | C-6 |
| Strobane AC-14 | C-6 |
| Sulfatep | P-4 |
| *sulfotepp* | P-4 |
| Sulfox-Cide | A-7 |
| *sulfoxide* | A-7 |
| Sulphenone | S-4 |
| synthetic pyrethrins | B-5 |
| Systam | P-21 |
| Systox | P-7 |
| Tabutrex | R-13 |
| Tedion | S-5 |
| Tedion V-18 | S-5 |
| Telone | F-8 |
| Terra Systam | P-20 |
| Tetram | P-26 |
| Tetron | P-1 |
| Thanite | T-5 |
| Thimet | P-10 |
| Thiodan | C-14 |
| Thiopos | P-28 |
| *toxaphene* | C-5 |
| Trithion | P-39 |
| Tritox | F-10 |
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## Insecticide Manufacturer's Index

Allied Chemical and Dye Corporation:
Barrett Division, 40 Rector Street, New York 6, New York
F-4, F-12, F-26, F-27, M-6, M-7, R-9, R-10.

General Chemical Division, Research Laboratory, P.O. Box 405, Morristown, New Jersey
C-1, C-11, D-1, D-2, D-19, F-32, M-8, S-2, S-3.

Solvay Process Division, Syracuse, New York
F-1, F-12, F-13.

American Cyanamid Company, Research Division, 1937 West Main St., Stamford, Connecticut
F-28, F-29, P-5, P-9, P-10, P-11, P-12, P-23, P-24, P-27, P-28, P-30, P-32, P-33, P-52, P-53, P-54.

American Potash and Chemical Corporation, Agricultural Chemicals Department (Eston), 3030 West Sixth Street, Los Angeles 54, California
F-17, F-18, F-19, F-20, P-1, P-28, S-1.

Atlantic Research Corporation, Kilgore Chemical Division, Alexandria, Virginia
A-9, A-10, R-7.

Barrett (see Allied Chemical and Dye Corporation)

Bayer, Der Farbenfabriken, Wuppertäl-Elberfeld, British Zone, Germany
P-7, P-8, P-13, P-16, P-19, P-28, P-29, P-31, P-34, P-41, P-42, P-43, P-44, P-50, P-51.

Benzol Products Company, 237 South Street, Newark 5, New Jersey
B-5.

Boots Pure Drug Company Ltd., Research Department, Island Street, Nottingham, England
S-7, S-9.

Carbide and Carbon Chemicals Company (see Union Carbide Corpiration)

Chemagro Corporation, 437 Fifth Avenue, New York 16, New York (jointly owned by Farbenfabriken Bayer and Pittsburgh Coke and Chemical)
P-7, P-8, P-13, P-16, P-29, P-30, P-34, P-43, P-50.

Chipman Chemical Company, Inc., Bound Brook, New Jersey
P-26.

Columbia-Southern (see Pittsburgh Plate Glass Company).

Commercial Solvents Corporation, Terre Haute, Indiana
D-5, D-6, D-7, D-10, D-11, F-15, F-23, R-9.

Diamond Alkali Company, Chlorinated Products Division, Union Commerce Building, Cleveland 14, Ohio
C-1, C-2, D-1, F-1, F-2, F-5, F-6, F-16, F-30, S-1.

Diamond Black Leaf Company, Union Commerce Building, Cleveland 14, Ohio (formerly Tobacco By-Products and Chemical Corp.)
H-3.

Dow Chemical Company, The, Midland, Michigan
D-13, F-1, F-2, F-3, F-4, F-5, F-6, F-7, F-8, F-9, F-11, F-12, F-13, F-14, F-17, F-18, F-19, F-20, F-21, F-22, F-24, F-25, H-1, H-2, M-2, M-3, M-4, M-5, N-2, N-4, N-5, P-36, P-37, R-3, R-14, S-1.

duPont deNemours, E. I., and Company, Inc., Grasselli Chemicals Department, Wilmington 98, Delaware
A-9, D-4, H-1, H-8, P-3, P-38, S-8, T-4.

Eston Chemical Company (see American Potash and Chemical Corp.)

Fairfield Chemicals (see Food Machinery and Chemical Corporation)

Fisons Pest Control Ltd., Cambridge, England
N-5, P-20, P-21, P-22.

Food Machinery and Chemical Corporation:
Fairfield Chemical Division, 1701 Patapsco Avenue, Baltimore 3, Maryland
A-1, A-2, B-1, B-4, B-5, R-7.

Niagara Chemical Division, Middleport, New York
C-14, P-15, S-5.

Westvaco Chlor-Alkali Division, South Charleston, West Virginia
C-1, F-1, F-18, F-20, F-30, P-1.

Frontier Chemical Company (see Union Chemical and Materials Corporation)

Geigy Chemical Corporation, Geigy Agricultural Chemicals (Division), P.O. Box 430, Yonkers, New York
D-1, D-4, D-8, D-15, D-18, H-4, H-5, H-6, H-7, P-46, P-47, P-48, P-49, R-17, S-15.

General Aniline and Film Corporation, Central Research Laboratory, Coal and Lincoln Streets, Easton, Pennsylvania
P-40, S-12, S-13, S-14.

General Chemical Company (see Allied Chemical and Dye Corporation)

General Dyestuff (see General Aniline and Film Corporation)

Glenn Chemical Company, 2735 North Ashland Avenue, Chicago 14, Illinois
R-13.

Goodrich, B. F., Company, B. F. Goodrich Chemical Company (Division), 3135 Euclid Avenue, Cleveland 15, Ohio
C-6.

Hercules Powder Company, Inc., Naval Stores Department, Agricultural Chemicals Laboratory, Wilmington 99, Delaware
C-5, P-45, R-15, T-5.

Holcomb, J. I., Manufacturing Company, Research Laboratory, 4401 Cold Spring Road, Indianapolis 8, Indiana
P-25.

Hooker Electrochemical Company, Niagara Falls, New York
C-1, C-2.

Hyman, Julius (see Shell Chemical Corporation)

Kilgore Chemicals, Inc. (see Atlantic Research Corporation)

Kolker Chemical Corporation, 600 Doremus Avenue, Newark 5, New Jersey
F-19.

Larvacide Products, Inc., Ringwood, Illinois
F-14.

Lebanon Chemical Company, P.O. Box 532, Lebanon, Pennsylvania
D-1.

McLaughlin Gormley King Company, Inc., 1715 Fifth Street, S.E., Minneapolis 14, Minnesota
A-8, B-4, B-5, R-12, R-18.

Merck and Co., Inc., Rahway, New Jersey
B-3.

Michigan Chemical Corporation, Saint Louis, Michigan
D-1, F-19.

Monsanto Chemical Company, Organic Chemicals Division, 800 North Twelfth Boulevard, St. Louis 1, Missouri
D-1, F-12, F-13, F-32, M-3, P-1, P-2, P-4, P-21, P-28, P-30, R-9, R-10, R-11.

Montrose Chemical Company, 104-12 Lister Avenue, Newark 5, New Jersey. Also affiliate Montrose Chemical Corporation of California
D-1, F-13, P-18, R-2, R-9, R-11, R-14, R-15, R-16.

Motamco, Inc., 89 Terminal Avenue, Clark, New Jersey
A-10, A-11.

Murphy Chemical Company, Ltd., Wheathampstead, St. Albans, Herts, England
P-20, P-21, S-1, S-3.

Naugatuck Chemical, Bethany 15, Connecticut
S-10.

Niagara Chemical Division (see Allied Chemical and Dye Corp.)

Olin Mathieson Chemical Corporation, Insecticides Division, Box 297, Port Jefferson Station, New York (includes former John Powell and Company, Inc.)
B-1, B-2, B-4, C-1, D-1, F-2, F-11, F-24, F-32.

Penick, S. B., and Company, 50 Church Street, New York 8, N. Y.
A-3, A-7, B-1, B-3, B-4.

Pennsylvania Salt Manufacturing Company of Washington, P.O. Box 1297, Tacoma, Washington
C-1, D-1.

Pest Control, Ltd. (see Fisons Pest Control Ltd.)

Pittsburgh Coke and Chemical Company, Grant Building, Pittsburgh 19, Pennsylvania
P-7, P-8, P-28, P-29.

Pittsburgh Plate Glass Company
Columbia-Southern Chemical Corporation (subsidiary), One Gateway Center, Pittsburgh 22, Pennsylvania
C-1.

Rohm and Haas Company, Washington Square, Philadelphia 5, Pa.
D-2, D-3, D-9, D-12, D-16, D-17, D-19, N-6, S-11, T-1, T-2, T-3.

Shell Chemical Corporation, 460 Park Avenue, New York 22, N. Y. (includes former Julius Hyman Company)
C-3, C-7, C-8, C-9, C-10, C-12, C-13, F-7, F-17, P-6, P-14, P-17.

Sherwin Williams Company, The, 1113 Guild Hall Building, Cleveland 1, Ohio
D-14.

Shulton, Inc., Clifton, New Jersey
A-4, A-5, A-6.

Solvay Process Division (see Allied Chemical and Dye Corporation)

Standard Agricultural Chemicals, Inc., Hoboken, New Jersey
N-1, N-2, N-3.

Stauffer Chemical Company, Agricultural Research Laboratory, 1496 Fremont Road, Mountain View, California
C-1, D-1, F-1, F-30, F-31, P-39, S-4.

Tobacco By-Products and Chemical Corporation (see Diamond Black Leaf Company)

Union Carbide and Carbon Corporation (see Union Carbide Corporation)

Union Carbide Corporation, Union Carbide Chemicals Company (Division), 30 East Forty-Second Street, New York 17, New York
B-6, F-3, F-24, R-1, R-2, R-4, R-5, R-6, R-8, R-14.

Union Chemical and Materials Corporation, Frontier Chemical Company (Division). Municipal Airport, Terminal Building, P.O. Box 545, Wichita 1, Kansas
C-1, F-1.

U. S. Industrial Chemicals, 99 Park Avenue, New York 16, N. Y.
A-1, A-2, R-7.

Velsicol Chemical Corporation, 330 East Grand Avenue, Chicago 11, Illinois
C-3, C-4, C-10.

Victor Chemical Works, 155 North Wacker Drive, Chicago 6, Illinois
P-1, P-4, P-30.

Virginia-Carolina Chemical Corporation, Research and Development Department, Richmond, Virginia
P-35.

Westvaco Chlor-Alkali Division (see Food Machinery and Chemical Corporation)

# PROCEEDINGS OF THE TWENTY EIGHTH ANNUAL MEETING

## Eastern Branch—Entomological Society of America

## *Atlantic City, N. J. – November 19-20, 1956*

The twenty-eighth Annual Meeting of the Eastern Branch, Entomological Society of America, was held at the Haddon Hall Hotel, Atlantic City, N. J., on Monday and Tuesday, November 19 and 20, 1956. Dr. F. W. Poos, Chairman, and Dr. C. C. Alexander, Vice-Chairman, presided and some 35 talks on papers were presented. In addition a panel discussion, *"Current Physiological Investigations Related to the Practical Work of Economic Entomologists,"* was presided over by Dr. John J. Pratt of the Quartermaster Research and Development Center the morning of the first day. On this panel were Robert L. Patton who discussed Civilian Laboratories; Vincent G. Dethier on Army Medical Service; Charles C. Hassett on Army Chemical Corps and John J. Pratt who discussed the Army Quartermaster Corps. A special symposium, *"Review of Current Mite Problems,"* was held the morning of the second day. The moderator was P. J. Chapman. Topics and participants were: (1) Control of Plant Mites by Philip Garman, (2) Current Studies of Predators of Plant-Feeding Mites by D. A. Chant, (3) Chemical Control of Spider Mites and the Genetics of Resistance by Floyd F. Smith, (4) Progress in Medical and Veterinary Acarology by Henry S. Fuller, (5) Experience with Mites by the Pest Control Industry by Ralph E. Heal, (6) Problems in the Identification of Mites by Edward W. Baker, (7) Outlook and Summary by George W. Whooton.

In addition, there was a panel discussion dealing with the problems of amateur growers of shrubs and ornamental plants and a film program showing motion pictures and slides of current or unusual interest. Both of these were presented Monday evening.

At the opening of the morning session on Monday, President B. A. Porter and Executive Secretary Robert H. Nelson of the parent society spoke briefly on current items of interest to members of the society.

At a short business meeting the first day the report of the secretary-treasurer was given and the financial statement presented was referred to the *Auditing Committee.* Chairman Poos appointed the following committees to report back at the final business meeting:

*Nominations*—Walter E. Fleming, J. L. Horsfall and P. J. Chapman, Chairman

*Auditing*—Lloyd E. Adams and Henry E. Gray

*Resolutions*—E. R. McGovran, George K. Schumaker and James M. Grayson, Chairman

### Report of the Secretary-Treasurer

The *Program and Local Arrangements Committee,* ably chairmaned by Ashley B. Gurney, met with the officers of the Eastern Branch in New Brunswick in May, 1956. A letter was sent out to the membership in June calling attention to the meeting in Atlantic City in November, 1956, and asking for suggestions. A second letter was sent out on September 1 asking for paper titles. The executive secretary, Robert H. Nelson, saved the group considerable time and money by addressing the letters and getting them out from the parent societies offices.

### Financial Statement

| | | |
|---|---|---|
| Balance on hand, November 1, 1955 | $768.29 | |
| Receipts during the year | 590.00 | |
| Total | | $1358.29 |
| Disbursements during the year | $491.42 | |
| Balance on hand, November 5, 1956 | 866.87 | |
| Total | | $1358.29 |

A detailed copy of the Financial Statement was examined by the Auditing Committee and is in the files of the undersigned.

Byrley F. Driggers
*Secretary-Treasurer*

The following committee reports were submitted and approved by the membership at the final business meeting on Tuesday morning, November 20, 1956.

### Report of the Resolutions Committee

*Whereas,* the following members have died since the last meeting of the Eastern Branch,

*Be It Resolved,* that the Eastern Branch of the Entomological Society of America, through its secretary, extends its sympathy to their families:

J. L. Buys
L. F. Byars
R. B. Knapp
W. H. W. Komp
N. E. McIndoo
L. M. Peairs

*Whereas,* officers and committees of the Eastern Branch have arranged for a successful meeting,

*Be It Resolved,* that the membership of the Eastern Branch express its grateful appreciation for the leadership of its officers, the fine work of the Program Committee including local arrangements, and the excellent co-operation of the Department of Entomology of Rutgers University in providing projection equipment and operators.

*Whereas,* B. A. Porter, President of the Entomological Society of America; R. H. Nelson, Executive Secretary; and B. B. Pepper, Eastern Branch Representative to the Governing Board, have brought the Eastern Branch such excellent reports of our Society,

*Be It Resolved,* that the Eastern Branch express its grateful appreciation to President Porter, Secretary Nelson, and Representative Pepper for their leadership in this fourth year of the Society and for their attendance at our annual meeting.

*Whereas,* the Membership Committee of the Eastern Branch has done such a splendid job of obtaining new members for the Entomological Society of America residing in the Eastern Branch territory,

*Be It Resolved,* that we express our sincere appreciation to Chairman A. C. Miller and the other members of the Membership Committee for their outstanding efforts.

*Whereas,* the Institute of Acarology at the University of Maryland so generously furnished supplies

and mimeographing service for the panel members participating in the mite symposium,

*Be It Resolved*, that we express our appreciation to the Institute of Acarology at the University of Maryland for these services.

*Whereas*, the management of the Hotel Haddon Hall has provided excellent facilities for our meeting,

*Be It Resolved*, that we express our appreciation to the management of the Hotel Haddon Hall.

Respectfully submitted,

E. R. McGovran
G. K. Schumaker
J. M. Grayson, Chairman

### Report of the Eastern Branch Representatives on the Governing Board of the Entomological Society of America

Your representative is happy to report that he was able to attend all sessions of the Governing Board at the annual meeting of the Society in Cincinnati. In addition to the formal sessions of the Board, considerable business was transacted by mail.

Since the Executive Secretary and President of the Association have given general coverage of the transactions by the Governing Board only the more important items as they may affect the Eastern Branch will be presented here.

(1) *Revision of the Constitution and By-Laws.* Your representative has had the pleasure of serving for the past two years on the special committee appointed by Presidents Decker and Porter to bring the constitution and by-laws up-to-date to meet current situations. The major proposed revision is to eliminate the subject matter sections as now listed, such as physiology, medical, chemical control, etc., and substitute two general divisions, namely, (a) basic entomology, and (b) applied entomology. The same number of representatives to the Governing Board will prevail, an equal number being elected from each of these major divisions. In order to accomplish this instead of the sections making nominations for representatives on the Governing Board, the Governing Board itself will become the nominating committee for this purpose. The special committee, as well as the Governing Board, believes that this is a more logical procedure than is the case where various sections nominate and elect their representatives to the Governing Board.

(2) *Branch Territories by Areas.* The question of branch territories by areas has come up for discussion. In the Eastern Branch heretofore Canadian provinces east of and including Ontario have been designated as Eastern Branch. The North Central States Branch has raised the question of whether or not part of the Province of Ontario, Canada, which is contiguous to the North Central States Branch should not be affiliated with that branch. President Porter has recommended that the Eastern Branch representative and the North Central Branch representative study this question and make their recommendations to the Governing Board at the forthcoming annual meeting in New York City.

Respectfully submitted,

Bailey B. Pepper

### Report of the Auditing Committee

Your Auditing Committee has examined the financial statement, books and records of the Secretary-Treasurer, Dr. B. F. Driggers, and finds them correct and in good order.

Respectfully submitted,

Lloyd E. Adam
Henry E. Gray, *Chairman*

### Report of the Membership Committee

The Eastern Branch conducted an active campaign for new members during 1956. The Committee of 31 members represented all areas covered by the Branch, including Eastern Canada. During the period January 17 to November 19, 1956, a total of 197 new members were obtained by the Branch. One hundred and twenty-three of these (95 active and 28 student) could be credited directly to the efforts of Committeemen. The other 74 new members were obtained through applications sent directly to the Executive Office. A number of these were through efforts of Committeemen. Also, some new members were obtained which are not included in the record because of residence outside the Eastern Branch territory. A complete roster of the Committee (with the exception of Mr. Louis G. Davis, a recent appointee) appears in the June, 1956 BULLETIN.

A series of five *Membership Committee Bulletins* were sent to the Committeemen during the campaign. Initially each worker was supplied with a complete list of members in his area through the co-operation of the Executive Office. The Bulletins kept workers informed of the efforts of fellow Committeemen, suggested new approaches to prospects, and attempted to stimulate competition among workers.

Edward H. Smith and his associates at Geneva, New York, lead the Committee in the number of new members obtained by a wide margin. His record, and that of other leading Committeemen, appears below.

| *Committeeman* | *Number of New Members* |
|---|---|
| Edward H. Smith | 34 |
| Elton J. Hansens | 18 |
| B. C. Dickinson | 12 |
| E. D. Burgess | 11 |
| Arnold Mallis | 9 |
| H. L. Seamans | 8 |
| W. B. Becker | 5 |

Committeemen J. G. Conklin, M. M. Darley, R. F. Darsie, C. K. Dorsey, H. L. Haynes, J. Peter Johnson, T. W. Kerr, Jr., E. F. Knipling, H. H. Schwardt, R. W. Sherman, and G. W. Simpson each obtained from one to four new members. Special thanks are due all these Committeemen and also others who, in spite of conscientious efforts, were unable to obtain new members.

Respectfully submitted,

A. C. Miller, Chairman

### Report of the Nominating Committee

Your committee proposes the following names to serve as officers of the Eastern Branch, E.S.A., for 1957:

*Chairman*—Dr. C. C. Alexander

*Vice-Chairman*—Dr. Neely Turner

*Secretary-Treasurer* (for 3 years)—Dr. B. F. Driggers

Respectfully submitted,

W. E. Fleming
J. L. Horsfall
P. J. Chapman, Chairman

The officers submitted by the *Nominating Committee* were duly elected.

The *Executive Committee* reported that the 1957 meeting would be held at the Hotel Commodore in New York City on Monday and Tuesday, November 25 and 26. The membership voted to approve the selection of the time and place.

The new chairman, C. C. Alexander, subsequently appointed the following committees to serve in 1957.

*Program Committee*—F. F. Smith, R. I. Sailer, F. R. Shaw, H. E. Gray, E. H. Smith, Chairman

*Membership Committee*—Elton H. Hansens, Chairman

*Sustaining Associates Committee*—W. E. McCauley, Chairman

*Nominating Committee*—E. H. Glass, Dean Asquith, E. H. Wheeler, Chairman

*Resolutions Committee*—M. P. Jones, R. L. Blickle, T. B. Kring, N. D. Blackburn, Chairman

*Auditing Committee*—M. M. Darley, A. M. Woodside, Chairman

Respectfully submitted,
Byrley F. Driggers
*Secretary-Treasurer*

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## PROCEEDINGS OF THE THIRTY-FIRST ANNUAL MEETING

### The Cotton States Branch—Entomological Society of America

### *Birmingham, Alabama – February 4, 5 and 6, 1957*

The thirty-first annual meeting of the Cotton States Branch, E.S.A., was held in the Dinkler-Tutwiler Hotel, Birmingham, Alabama, on February 4, 5, and 6, 1957. The meeting was held in connection with the Association of Southern Agricultural Workers. One hundred sixty-five members and guests registered for the three-day meeting. Chairman A. N. Tissot opened the meeting promptly at 9:30 a.m. on February 4. W. G. Eden officially welcomed the Branch to Alabama. Chairman Tissot appointed the following committees:

*Auditing:* A. M. Phillips, W. R. Smith, and E. H. Floyd, Chairman.

*Nominating:* W. E. Wagner, V. M. Kirk, W. A. Ruffin, J. C. Alden, and J. W. Wilson, Chairman.

*Resolutions:* W. W. Stanley, R. L. Robertson, and C. R. Jordan, Chairman.

*Ballot count on constitution:* J. T. Conner, F. J. Bartlett, and K. L. Cockerham, Chairman.

Vice-Chairman Norman Allen assumed the chair and officially accepted for the Branch a gavel presented by A. N. Tissot and the *Membership Committee.* The head and handle of the gavel each contain nine equal sized pieces of wood, one from each state in the Branch. The various woods and the members who gave them are as follows: longleaf yellow pine, Alabama, G. H. Blake, Jr.; southern red cedar, Arkansas, W. D. Wylie; tidewater cypress, Florida, H. S. Mayeux; live oak, Georgia, J. C. Alden; cypress, Louisiana, I. J. Becnel; osage orange, Mississippi, A. L. Hamner; southern white cedar, North Carolina, F. E. Guthrie; yellow pine, from John C. Calhoun mansion, South Carolina, W. T. Chamberlain; and red oak, Tennessee, W. W. Stanley. The wood of each state is easily recognized as the Alabama pine is on one side of the handle and the states follow in alphabetical order to the Tennessee oak on the opposite side of the handle. Mr. Allen then presented the Chairman for his annual address. Chairman Tissot reported on a study he had made of the background, training and experience of entomologists working in the Southeast, based on a questionnaire which was sent to all members of the Cotton States Branch.

Mr. H. M. Armitage, President of the Entomological Society of America, represented the parent society at the meeting. In his address he discussed the functions and problems of the national society and pledged the cooperation of the national organization with the Cotton States Branch.

A total of 82 papers were presented during the three-day meeting. Included were invitational papers by Frank Holland and J. S. Roussel and a nine-paper symposium on "*Recent Insect Invaders.*" The symposium included discussions on the European corn borer, the pepper maggot, the white-fringed beetles, and the Mediterranean fruit fly. The other papers covered a wide variety of work being carried on within the Cotton States Branch. The *Committee on Local Arrangements* was composed of N. R. Downey, J. E. Zeigler, and G. R. Williamson, Chairman.

In the business sessions the following business was approved:

1. SECRETARY'S REPORT. The secretary's report showed that five communications were sent to the membership during the year. These were notice of the thirty-first annual meeting, one for the Branch Chairman, two in connection with the adoption of the Constitution and by-laws, and the published program.

2. REPORT OF THE EXECUTIVE COMMITTEE. The following members of the *Executive Committee* met on February 3: H. C. Young, O. I. Snapp, Norman Allen, W. G. Eden, and A. N. Tissot. Various problems in connection with the meeting were discussed. Inasmuch as the Alabama Polytechnic Institute paid W. G. Eden five dollars per day subsistence for the meeting, the Committee voted to supplement his per diem by seven dollars per day. No action was taken that required approval of the Branch.

3. REPORT OF THE AUDITING COMMITTEE. We, the *Auditing Committee* of the Cotton States Branch, E.S.A., have examined the books and accounts of the Secretary-Treasurer, W. G. Eden, Auburn, Alabama, for the year 1956-57. The following balance is now on hand:

| | |
|---|---|
| Checking account | $238.70 |
| Savings account | 139.38 |
| Balance on hand, Jan. 25, 1957 | $378.08 |

The accounts are balanced with receipts and vouchers and appear true and correct:

W. R. Smith
A. M. Phillips
E. H. Floyd, Chairman

4. REPORT OF THE CONSTITUTION AND BY-LAWS COMMITTEE. The *Committee for Preparation of a Constitution and By-Laws* for the Cotton States Branch assembled those of other branches and of the national society. After careful study of the other constitutions a proposed constitution was prepared and submitted to the membership for consideration and comments. After these were received a revised draft was submitted to the membership with a ballot for approval or disapproval. An affirmative vote of two-thirds of those voting was required for adoption, as rec-

ommended by the Executive Committee and approved by the Branch at the 1956 annual meeting.

F. E. Guyton
R. F. Hussey
G. G. Rohwer
Clay Lyle
J. T. Conner
S. W. Simmons
J. C. Cochran, Chairman

5. REPORT OF THE BALLOT COMMITTEE ON ADOPTION OF THE CONSTITUTION AND BY-LAWS. The committee for checking the ballots on adoption of the proposed constitution and by-laws for the Cotton States Branch report the following count:

| | |
|---|---|
| For approval | 200 |
| For disapproval | 14 |
| Blank | 1 |
| For approval (received after the January 15 deadline) | 4 |

Respectfully submitted,

J. T. Conner
F. J. Bartlett
K. L. Cockerham, Chairman

6. REPORT OF THE PROGRAM COMMITTEE. The *Program Committee* expressed its appreciation to the membership for the fine cooperation in submitting and presenting papers at the meeting. There were 69 papers on the printed program, two papers not in the printed program, two invitational papers, and nine in the symposium, or a total of 82 papers. The *Program Committee* requested the secretary to poll the membership before the 1959 meeting to determine if it wants a banquet and symposium at that meeting. The committee appointed by Dr. Tissot, for the indicated times of service, according to the plan adopted at the 1956 meeting, consists of:

Hamilton Laudani (1 yr.)
R. J. Kowal (1 yr.)
J. W. Wilson (2 yrs.)
J. E. Zeigler (2 yrs.)
V. M. Kirk (3 yrs.)
L. C. Murphree (3 yrs.), Chairman

7. REPORT OF THE MEMBERSHIP COMMITTEE. The *Membership Committee* has made personal contacts, extended invitations at meetings, and by several other means attempted to increase membership in the Society. As of January 28, 1957, cards for 42 applicants for active membership or reinstatements and 11 for student memberships have been received from the Executive Secretary. Several others have expressed their intentions to join.

The various states in the Branch have the following numbers of Society members respectively, exclusive of the 1956 and 1957 applicants:

| | |
|---|---|
| Alabama | 27 |
| Arkansas | 24 |
| Florida | 140 |
| Georgia | 75 |
| Louisiana | 59 |
| Mississippi | 52 |
| North Carolina | 50 |
| South Carolina | 30 |
| Tennessee | 27 |
| Total | 484 |

The *Membership Committee* wishes to thank the secretaries and others who have made contributions, without which its work would have been more handicapped. The Chairman wishes to thank R. H. Nelson for making available a card index of the membership by states, from which a list was made for each committee member for his state. The index has been retained by the Chairman for future use by the branch. The *Membership Committee* appointed by Dr. Tissot for the indicated times of service, according to the plan adopted at the 1956 meeting, includes:

I. J. Becnel (1 yr.), Louisiana
H. S. Mayeux (1 yr.), Florida
W. W. Stanley (1 yr.), Tennessee
F. E. Guthrie (2 yrs.), North Carolina
J. C. Alden (2 yrs.), Georgia
W. D. Wylie (3 yrs.), Arkansas
G. H. Blake (3 yrs.), Alabama
W. F. Chamberlain (3 yrs.), South Carolina
G. D. Jones, National Committee
A. L. Hamner (2 yrs.), Mississippi, Chairman

8. REPORT OF THE COMMITTEE ON SUSTAINING ASSOCIATES. The program to obtain sustaining associates was begun in late 1955. At that time eight companies in the Cotton States Branch took out membership, three for 1955 and five for 1956. Executive Secretary R. H. Nelson has contacted these companies concerning their renewals. Three 1955 members have not renewed. We do not have complete information concerning the renewal for 1957 of the 1956 members. Some have renewed, one for $200.00, which is the only sustaining associate member in E.S.A. that paid more than the $100.00 minimum. We have one new member for 1957, the Freeport Sulphur Company. The *Committee* was appointed by Dr. Tissot for the indicated terms of service according to the plan adopted at the 1956 meeting.

W. A. Ruffin (1 yr.)
W. C. Nettles (1 yr.)
G. W. Dekle (2 yrs.)
L. D. Newsom (3 yrs.)
C. R. Jordan (3 yrs.)
C. F. Smith (2 yrs.), Chairman

9. REPORT OF THE REPRESENTATIVE TO THE GOVERNING BOARD, E.S.A. I attended the meetings of the *Governing Board* in New York at the invitation of M. D. Farrar who was the retiring representative of the Cotton States Branch. Attending these sessions gave me a better understanding of the operation of our Society and should make me a better representative for the Branch. I pledge my fullest cooperation to the Branch and to the Society during my tenure on the Board.

O. I. Snapp, Representative 1957-1959.

10. PROJECTION EQUIPMENT. Following action at the 1956 meeting Dr. Tissot appointed a committee of F. J. Bartlett, K. S. Littig, and W. G. Eden (Chairman) to procure projection equipment for Branch meetings. After investigations were made on the cost of such equipment. it was determined that the Branch could not afford the equipment, and the committee so reported to the Branch.

A motion was made by H. S. Mayeux that (1) the *Executive Committee* be authorized and instructed to purchase in time for the 1958 meeting the following equipment: (a) 35 mm projectors, (b) 3¼" x 4" projectors, (c) projection screens, (d) accessories (extension cords, etc.), the models selected to be fully adequate for use at Branch meetings; (2) the entire residue of the Branch entertainment fund, remaining when all obligations of this meeting have been paid, shall be made available for the purpose of buying this equipment; (3) the Secretary-Treasurer shall write the usual letter of thanks to the various

companies and others who contributed in 1957, stating that there is a residue, and informing them of the need for projection equipment and that it is being purchased with the residue; and if any contributor objects to such use of the funds, his prorata share will be retained in the entertainment fund and will not be used for this purpose; and (4) that the Secretary-Treasurer shall be responsible for the care of the projection equipment and see that it is at the meetings ready for use.

The motion was passed by the Branch.

11. REPORT OF THE NOMINATING COMMITTEE. We submit the following for officers of the Cotton States Branch for terms as indicated:

Chairman—Norman Allen (1 yr.)
Chairman-elect—Charles G. Lincoln (1 yr.)
Secretary-Treasurer—M. E. Merkl (3 yrs.)
Executive Committee—H. S. Mayeux (1 yr.)
Executive Committee—J. K. Reed (1 yr.)

W. E. Wagner
V. M. Kirk
W. A. Ruffin
J. C. Alden
J. W. Wilson, Chairman

The report of the committee was accepted and the officers were elected.

12. REPORT OF THE RESOLUTIONS COMMITTEE. *Whereas*, the success of our meeting was largely dependent upon the planning and efforts of many people,

*Therefore, be it resolved*, that the Cotton States Branch of the Entomological Society of America here convened in the Dinkler-Tutwiler Hotel, Birmingham, Alabama, on February 4, 5, and 6, 1957, express thanks and appreciation to all those who have contributed to the success of the meeting, and especially to the following:

To A. N. Tissot for his interest and efforts as Chairman in behalf of the Branch, for his excellent address at the annual meeting, and for his ingenuity in making the beautiful gavel which was presented to the Branch, and

To W. G. Eden for his outstanding service as Secretary-Treasurer, and

To G. R. Williamson and other members of his committee for their time and efforts in making the local arrangements, and

To L. C. Murphree and other members of the *Program Committee* for arranging an interesting and informative program, and

To J. H. Cochran and other members of the committee for preparing the Constitution and by-laws, and

To Miss Carol Lollar and Mrs. S. C. Riggan for their assistance in registration, and

To H. M. Armitage for his interesting report on the activities of the parent organization, and

To H. M. Armitage, R. H. Nelson, and F. W. Poos for their sincere interest and participation in our meeting, and

To Frank Holland and J. S. Roussel for their excellent invitational addresses, and

To J. T. Creighton for the effort he expended in making the symposium a successful part of the program, and

To Loveman's Department Store for its gracious hospitality in providing the breakfast and fashion show for the ladies in attendance.

*Whereas*, thirty-two commercial companies have graciously contributed to the success of the meeting,

*Therefore be it resolved*, that the secretary be directed to send to these companies a letter of appreciation in behalf of the Branch.

*Whereas*, the present Civil Service ratings detract from the professional status of entomologists and other scientists in the various branches of the Federal service,

*Therefore be it resolved*, that the Cotton States Branch recognize and support the move to restore professional ratings in the classification of Civil Service employees.

*Whereas*, the Branch has lost by death three of its faithful and esteemed associates: J. H. Girardeau, Sr., G. C. Broome, and David Dunavan,

*Therefore be it resolved*, that the Secretary be instructed to write their families letters of condolence.

W. W. Stanley
R. L. Robertson
C. R. Jordan, Chairman

Respectfully submitted,

W. G. Eden
Retiring Secretary-Treasurer

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## PROCEEDINGS OF THE FIFTH ANNUAL MEETING

### Southwestern Branch—Entomological Society of America

### *San Antonio, Texas—March 11-12, 1957*

The Fifth Annual Meeting of the Southwestern Branch of the Entomological Society of America was held in San Antonio, Texas, March 11 and 12, 1957.

The meeting was called to order by Chairman J. C. Gaines. Following the invocation, Vice-Chairman H. L. Chada assumed the chair and presented the Honorable E. R. Crumrine, mayor pro tem of San Antonio, in an address of welcome. Following the address, Mr. Chada introduced the Chairman, J. C. Gaines, who gave the Annual Address of the Chairman.

Following the appointment of committees, Mr. P. J. Reno presented the report of the Southwestern Branch Member of the Governing Board.

The assembled group of 220 enjoyed remarks of the President of the Entomological Society of America, Mr. H. M. Armitage, relative to the status and future plans of the national association.

The Invitational Address, "*Biochemical Explanation for the Cause of Insecticide Resistance*," was presented by Dr. Clyde W. Kearns, Professor, Department of Entomology, University of Illinois, Urbana, Illinois.

Fifty-three submitted papers were presented during the meeting.

A buffet supper was held Monday night, May 11, followed by a short entertainment program, which, according to those present, was most enjoyable.

Chairman Gaines called for the following reports:

**Treasurer's Report**

| | | |
|---|---|---|
| Feb. 2, 1956 Balance on hand | | $422.90 |
| Feb. 2, 1956 Registration Fee 1956 convention | | 450.00 |
| Total amount on hand | | $872.90 |
| Disbursements: | | |
| Badges (1956 meeting) | $ 25.29 | |
| Badges (1957 meeting) | 25.29 | |
| Printing | 207.90 | |
| Total disbursements | $258.48 | 258.48 |
| Balance March 1, 1957 | | $614.42 |

Respectfully submitted,
Sherman W. Clark
*Secretary-Treasurer*

**Report of the Auditing Committee**

We, the Auditing Committee of the Southwestern Branch, Entomological Society of America, have on this 11th day of March, 1957, examined the receipts and expenditures of the Secretary-Treasurer of the Branch and do hereby certify that said receipts and expenditures are in order.

Respectfully submitted,
George P. Wene
Chas. A. King, Jr.
C. R. Parencia, *Chairman*

**Report of the Nominating Committee**

The *Nominating Committee* nominated officers for 1957 as follows:

Chairman, C. R. Parencia
Vice-Chairman, R. R. Walton
Member Executive Committee, George P. Wene
Member Governing Board, Chas. M. Meadows
(to replace P. J. Reno, resigned)

The membership unanimously approved the nominations. Since the Secretary-Treasurer is elected for a two-year period, no nominations for this office were in order.

**Report of the Committee on Resolutions**

The Resolutions Committee was composed of F. M. Fuller, Jr., and F. A. Fenton, Chairman.

The following resolutions were adopted by the membership:

*Whereas*, the Southwestern Branch of the Entomological Society of America has lost one of its faithful and esteemed associates, Robert K. Fletcher

*Therefore be it resolved*, that the secretary be instructed to write his family a letter of condolence and that the members present rise for a minute of silent meditation in his memory.

*Whereas*, the excellent facilities of the Gunter Hotel have been made available by the management and staff to the complete satisfaction of the membership

*Therefore be it resolved*, the members of the Southwestern Branch of the Entomological Society of America appreciate the Hotel's services and extend to it thanks for its courtesies.

*Whereas*, the members of the Committee on *Local Arrangements* have been responsible for the arrangements of the meeting and through their untiring efforts have made it an outstanding success,

*Therefore be it resolved*, that the membership of this Society express its appreciation and thanks for their contribution.

*Whereas*, P. J. Reno has served long and faithfully as a member of the Southwestern Branch of the Entomological Society of America and more recently as a representative from this Branch to the Governing Board of the Entomological Society of America, and since it has become necessary for him to resign and move his membership to another Branch,

*Therefore be it resolved*, that the membership of this Branch express its appreciation for his many contributions as a member and officer.

*Whereas*, H. M. Armitage, President of the Entomological Society of America, has honored us with his presence and has given us such a splendid address on the ideals and plans for the future of our society,

*Therefore be it resolved*, that the membership of this Branch extend to him our appreciation of his presence here and the best of wishes for a successful administration of the affairs of the Entomological Society of America.

*Whereas*, R. H. Nelson, Executive Secretary of the Entomological Society of America, has honored us with his presence,

*Therefore be it resolved*, that the membership of this Branch express its appreciation for his presence and for the splendid work that he is doing in managing the affairs of his office, and we wish him continued success in this undertaking.

Respectfully submitted,
F. M. Fuller, Jr.
F. A. Fenton, *Chairman*

March 12, 1957

Houston was selected as the meeting place for the 1958 convention.

The consensus of opinion of the membership was that this was one of our most successful conventions.

Respectfully submitted,
Sherman W. Clark
*Secretary-Treasurer*

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## PROCEEDINGS OF THE TWELFTH ANNUAL MEETING

### North Central Branch—Entomological Society of America

### *Des Moines, Iowa — March 27, 28 and 29, 1957*

**Business Sessions**

C. E. Mickel, *Presiding*
C. W. Wingo, *Secretary*

**Preliminary Business Session**

The preliminary business session of the North Central Branch was called to order by Chairman C. E. Mickel at 11:40 a.m., March 27, 1957 at Hotel Savery, Des Moines, Iowa.

Chairman Mickel appointed or revised committee appointments for 1957 as follows:

*Reporting Committee*—C. W. Wingo, Ray T. Everly, Chairman

*Auditing Committee*—Wm. Luckmann, John Lofgren, Chairman

Secretary C. W. Wingo was requested to report on the actions of the *Executive Committee* to the membership.

### Report of the Executive Committee

During the year the *Executive Committee* unanimously voted to set Student Branch Membership Registration at annual conferences at $2.00, which includes Proceedings for the meeting.

The first meeting of the *Executive Committee* was held at 9:10 p.m., March 26, 1957 at Des Moines, Iowa.

Several actions of the Governing Board of the Entomological Society of America were reported by Branch Representative Apple, and were discussed by the committee.

First, the Governing Board declined to approve the Pacific Branch proposal for the parent Society to collect one dollar from each branch member to be turned over to the respective branches for current expenses. The board also did not approve proposals for increase in Society dues in 1957.

Second, the Board approved the affiliation of Canadian members with branches as follows: Eastern provinces and Ontario east of 80° long. to be affiliated with the Eastern Branch; Manitoba and Ontario west of 80° long. to be affiliated with the North Central Branch; provinces west of Manitoba to be affiliated with the Pacific Branch.

In accordance with Article I, Section 1 of the Branch Constitution, the Executive Committee approved a motion to invite Canadian members of E.S.A. in the designated area to petition the North Central Branch for affiliation if they so desire. The secretary was instructed to so inform Canadian members and furnish forms for reply.

The time of the 1959 meeting was designated as March 25, 26 and 27 with the place to be announced at the last business session.

A motion to increase the annual fee of the Recorder to $50.00 was unanimously approved.

### Report of the Nominating Committee

The following roster of candidates was selected by the *Nominating Committee* for election to office at the 1957 Annual Meeting:

*Chairman-elect*—John Callenbach, Roscoe Hill

*Representative to the Governing Board*—T. C. Allen, J. Everett Bussart

*Executive Committee Member-at-Large*—A. W. Buzicky, Ralph Davidson

Respectfully submitted,

E. T. Hibbs
George Wagner
C. R. Neiswander, Chairman

The Secretary reported no additional nominations had been made by mail.

Chairman Mickel adjourned the meeting at 11:58 a.m.

### Final Business Session

The final business session was called to order by Chairman Mickel at 8:35 a.m., March 29, 1957 at Hotel Savery, Des Moines, Iowa.

The Chairman called for new business. There was none and the chair called for the report of the second session of the Executive Committee.

### Report of Second Session of Executive Committee

The second session of the *Executive Committee* was held at 9:15 p.m., March 28, 1957 at Hotel Savery. The committee selected Columbus, Ohio as the site of the 1959 Branch Conference to be held March 25, 26 and 27.

The committee voted to increase the fidelity bond of the Secretary-Treasurer from $1500 to $2000.

The committee adjourned at 10:20 p.m.

The Chairman then called for the Treasurer's report.

### Treasurer's Report

March 22, 1956 to March 22, 1957

| | | |
|---|---|---|
| Balance on hand March 22, 1956 | $ 513.87 | |
| Receipts during the year | 1190.00 | |
| Total | | $1703.87 |
| Disbursements during the year | 943.69 | |
| Balance on hand March 22, 1957 | 760.18 | |
| Total | | $1703.87 |

A detailed copy of the Treasurer's Report was examined by the *Auditing Committee* and is in the files of the undersigned.

Curtis W. Wingo
*Secretary-Treasurer*

### Report of Auditing Committee

The Treasurer's books have been examined and found to be correct.

Respectfully submitted,

Wm. Luckmann
John Lofgren, Chairman

It was moved, seconded and passed that the reports of the Treasurer and *Auditing Committee* be approved.

### Report of the Resolutions Committee

**Resolution No. 1**

*Whereas*, The North Central Branch of the Entomological Society of America during its twelfth Annual Meeting has enjoyed participating in a well-balanced and well-arranged program and has enjoyed excellent meeting facilities,

*Be It Resolved*, that the members of this Branch extend their appreciation to the *Program Committee*, the *Committee on Local Arrangements*, the Officers of the Branch and the staff and management of the Hotel Savery, and

*Be It Further Resolved*, that the members of the Branch extend their thanks to the students of Iowa State College for their precise and coordinated operation of lights and projection equipment and their constant assistance during the meetings.

**Resolution No. 2**

*Whereas*, the Program was published for the second consecutive year through the courtesy of the Midwest Farm Paper unit comprised of *The Farmer*, St. Paul, Minnesota; *The Nebraska Farmer*, Lincoln, Nebraska; *The Prairie Farmer*, Chicago, Illinois; *Wallace's Farmer & Iowa Homestead*, Des Moines, Iowa; and the *Wisconsin Agriculturist & Farmer*, Racine Wisconsin,

*Be It Resolved*, that the Branch thank these companies for their courtesy and that the Secretary be instructed to write them individually expressing our appreciation.

**Resolution No. 3**

*Whereas*, it is highly desirable to keep the general public informed and interested in the many aspects of the science of Entomology,

*Be It Resolved*, that the Branch Chairman and the *Executive Committee* consider the appointment of a standing committee to publicize the activities of Entomologists in the North Central States in an effort to bring about a more complete understanding and appreciation of the Entomological problems and accomplishments in the area and that the committee not be concerned with publicity for the annual meetings.

**Resolution No. 4**

*Whereas*, there is a need for increased public recognition of Entomology as a profession,

*Be It Resolved*, that the North Central Branch encourage and support the efforts of the Standing Committee of the Entomological Society of America on Training, Standards and Status.

**Resolution No. 5**

*Whereas*, these workers, George Dean, Harry Bryson and J. G. Sanders, of the North Central Branch have passed to their reward during the past year,

*Be It Resolved*, that the Branch express its deepest sympathy to the families of these men.

Resolutions Committee

John Wright
C. R. Weaver
Philip C. Stone, Chairman

It was moved, seconded and passed that each resolution be approved by the membership.

**Report of the Membership Committee**

As of March 19, 1957, E.S.A. membership in the North Central Branch area totaled 755. This was an increase of 67 over the same time last year.

Each member of the Committee was assigned a four-state area, and he, in turn, delegated an E.S.A. member from each larger city or entomology center to coordinate the individual drives at the local level.

The Executive Secretary of the parent society was helpful in supplying names and addresses of E.S.A. members by states.

H. C. Cox was an original member of the Committee, but was replaced by W. S. Craig when Mr. Cox was transferred out of the North Central area.

Respectfully submitted,

H. B. Petty, Jr.
Wilfred S. Craig
Herbert Knutson, Chairman

**Report of the Nominating Committee**

The *Nominating Committee* reported that the newly-elected officers of the Branch were:

*Chairman-elect*—Roscoe Hill

*Representative to the Governing Board*—J. Everett Bussart

*Executive Committeeman at Large*—A. W. Buzicky

Following the report of the *Nominating Committee*, Chairman Mickel congratulated the new officers and introduced the new Chairman, Don Wilbur.

**New Business**

Chairman Wilbur appointed the following committees:

*Local Arrangements Committee*—George Ludvik, Wilbur Enns, J. Carl Dawson, J. Marshall Magner, Chairman

*Program Committee*—O. H. Hammer, Jean Lafoon, H. H. Walkden, Chairman

*Resolutions Committee*—D. Lyle Goleman, J. G. Rodriguez, C. D. Michener, Chairman

*Auditing Committee*—H. J. Ball, Geo. W. Thomas, Chairman

*Sustaining Associates Committee*—Galen Hinkle, R. L. Janes, Leo Iverson, Chairman

*Membership Committee*—Harlan Shuyler, Wayne Colberg, H. B. Petty, Chairman

*Nominating Committee*—Roy Rings, Reginald Painter, John V. Osmun, Chairman

*Recording Committee*—C. W. Wingo, Ray Everly, Chairman

**1958 Annual Meeting**

Chairman Wilbur announced that the 1958 meeting would be held at St. Louis, Missouri, March 26, 27 and 28, 1958.

Respectfully submitted,

Curtis W. Wingo
*Secretary-Treasurer*

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# A LOOK AT OURSELVES[1]

A. N. Tissot
*Head, Entomology Department*
Florida Agricultural Experiment Station, Gainesville

When it came time to choose a topic for the annual address of the chairman for the 1957 meeting of the Cotton States Branch, the thoughts of the writer went back to the 1956 meeting when Professor F. E. Guyton reported on the findings of the *Curriculum Committee* of which he was chairman. That report reflected the thoughts of members of the Branch on the training and experience which seemed desirable for students in entomology who are to receive graduate degrees. During the presentation of that report it occurred to the writer that it would be interesting to know more about the members themselves and about their thinking on other matters. As a consequence, a questionnaire was prepared and sent to all members of the Cotton States Branch. There were approximately 590 names on the mailing list and 223 filled-in usable questionnaires were returned. As 36.5 percent of the membership thus responded, the returns should give a representative picture of the entire group.

[1] Address of the Chairman, Thirty-First Annual Meeting, Cotton States Branch, Entomological Society of America, Birmingham, Alabama, February 4, 1957.

The questionnaire requested information on the birthplaces of members, where they received their schooling, an evaluation of the training they received in college and graduate school, the type of organization with which they are now associated, the nature of their work, what they consider to be the more important problems confronting entomologists today and to what phases or fields of entomology we should give special attention during the next five to ten years. The replies to these queries are summarized below.

**Origins and Backgrounds of Members**

The members of the Branch came from many places in this country and a few were born outside the United States. The list of birthplaces represents 41 states, the District of Columbia, and five foreign countries. Two members were born in Canada and one each in England, Greece, Italy, and Poland. Table 1 shows the number of members born in the various states of the Branch and in several states outside the area which produced appreciable numbers.

**Table 1.—Birthplaces of Cotton States Branch Members**

| | Ala. | Ark. | Fla. | Ga. | La. | Miss. | N.C. | S.C. | Tenn. | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| No. reporting all ages | 13 | 7 | 14 | 15 | 11 | 25 | 2 | 12 | 1 | 100 |
| Age over 35 years | 9 | 5 | 6 | 11 | 9 | 21 | 2 | 8 | 0 | 71 |
| Age under 35 years | 4 | 2 | 8 | 4 | 2 | 4 | 0 | 4 | 1 | 29 |

| | Ohio | New York | Pennsylvania | Massachusetts | Illinois | Total Born in Branch States | Percent | Total born elsewhere | Percent |
|---|---|---|---|---|---|---|---|---|---|
| No. reporting all ages | 18 | 11 | 11 | 8 | 7 | 100 | 44.8 | 123 | 55.2 |
| Age over 35 years | 16 | 10 | 8 | 6 | 5 | 71 | 41.5 | 100 | 58.5 |
| Age under 35 years | 2 | 1 | 3 | 2 | 2 | 29 | 55.3 | 23 | 44.7 |

This table shows an interesting and significant trend, particularly when age groups are considered. Only 41.5 percent of members over 35 years of age were born within the Branch area, whereas 55.3 percent of those under 35 were born here. This means that the younger men now beginning their entomological careers in the Southeast have a better knowledge of the agriculture of the region and of the insect pest problems peculiar to it and thus have an advantage over their elders who came from elsewhere. It seems safe to predict that this trend will continue and that more and more of our entomologists will be products of this area.

Members were asked to indicate if their youth was spent in the country or in town. One hundred-two stated that they lived in the country, 87 spent early years in small towns and 54 lived in cities of ten thousand or more.

### Educational Background

As the members came from so many places it logically follows that they attended many different schools. The returns show that they received their education in 42 states, the District of Columbia and two foreign countries. Table 2 shows the number who attended grade and high school, who received their undergraduate training, and who did graduate work in the various states of the Branch. Similar information is given for several other states that contributed materially to the education of our members.

It is interesting to note that every member who returned a questionnaire has earned at least the bachelor's degree. Master's degrees are held by 161 of the 223 members and 110 have taken the doctor's degree.

It is obvious that members of our Branch are entomologists by training as well as by profession. The questionnaires show that 192 had entomology as their major, either at the undergraduate or graduate level or both. An additional 24 had a minor in entomology.

Members were asked to evaluate the training they received in college. Apparently the schools are doing an admirable job for 144 members reported that they are well pleased with the training they received, while 74 stated that they are fairly well satisfied. The remaining five either were dissatisfied or did not check this item. Two-thirds of those replying indicated that they would take about the same courses if they were going through school again. Some who consider their training not entirely satisfactory stated that they would take more basic courses. Thus, 31 indicated that they would like more chemistry and 21 said more mathematics and statistics. Several mentioned such courses as general zoology, physiology, ecology, nematology and plant pathology. Smaller numbers suggested that more work in English, writing, and grammar would be helpful and that courses in public speaking, business administration, human relations and logic are desirable for entomologists.

**Table 2.—Where Members Received Their Schooling**

| | Grade and High School | Undergraduate | Graduate |
|---|---|---|---|
| Alabama | 17 | 16 | 8 |
| Arkansas | 8 | 6 | 2 |
| Florida | 21 | 24 | 19 |
| Georgia | 14 | 8 | 2 |
| Louisiana | 11 | 14 | 14 |
| Mississippi | 23 | 22 | 11 |
| North Carolina | 3 | 5 | 10 |
| South Carolina | 12 | 13 | 3 |
| Tennessee | 2 | 3 | 2 |
| Total | 111 | 111 | 71 |
| Ohio | 16 | 13 | 19 |
| New York | 11 | 9 | 23 |
| Iowa | 7 | 7 | 20 |
| Massachusetts | 10 | 10 | 5 |
| Illinois | 9 | 5 | 10 |
| Oklahoma | 5 | 6 | 9 |
| Wisconsin | 4 | 5 | 7 |
| California | 5 | 7 | 6 |
| Kansas | 6 | 4 | 5 |
| Maryland | 5 | 4 | 7 |
| Total | 78 | 60 | 111 |

### Professional Experience of Branch Members

The second part of the questionnaire concerns the entomological activities of the members of the Cotton States Branch. The returns show the kinds of organizations or concerns with which the members are associated and also something of the nature of their work. The answers and comments likewise reveal the degree of satisfaction that members derive from their work and their appraisal of entomology in comparison with other sciences and professions. There are no lists available which show the job affiliations of members of the Branch so it is not known how representative the returns may be in that regard. It seems possible, however, that a larger percentage of members employed by the states and the Federal government returned the forms than of those engaged in commercial phases of entomology. Perhaps this is not surprising since persons working for public agencies are more accustomed to filling out forms and preparing reports of various sorts. It is not believed that the differences are great enough to adversely affect the validity of the returns.

Table 3 shows the numbers of members in five different employment categories and it also indicates the nature of their entomological activities.

**Table 3.—Professional Experience of Members**

| | States | Federal Government | Commercial | Self-Employed | Others |
|---|---|---|---|---|---|
| Number employed by | 100 | 64 | 28 | 15 | 11 |

| | Research | Administration | Teaching | Extension | Regulatory | Miscellaneous* |
|---|---|---|---|---|---|---|
| Number in | 105 | 44 | 25 | 12 | 10 | 27 |

* Consultant, sales, promotion, development.

The questionnaire asked, "How satisfied are you with your present work?" This may not have been a very wise choice of words as one member commented, "Anyone who is 'satisfied' isn't worth having—may as well bury him." Perhaps "contented" or "pleased" would have conveyed the intended thought better. Nevertheless 181 persons stated that they are well satisfied to completely satisfied. An additional 24 indicated that they are fairly well satisfied with their work. The remaining 18 are dissatisfied, some extremely so.

Few of those who are well satisfied made further comments on their work but some of the statements by members in the dissatisfied groups are worthy of attention. Nine are not pleased with the remuneration they receive and about half of these mentioned the low salaries of entomologists in comparison with those of workers in other sciences and professions. One person said that he is not satisfied with his work though the salary is good. Apparently there is not always a correlation between the amount of salary received and satisfaction with the work for a number of those indicating complete satisfaction are in the lower levels of the income range. Other reasons for dissatisfaction include "too much red tape," not enough time for research, too frequent transfers to new locations and poor areas of assignment.

Those not satisfied with entomology were asked to indicate the field or profession they would enter if they had a free choice. Nine persons stated that they would choose some branch of medicine or dentistry. In several cases these choices were admittedly based on the comparatively high incomes enjoyed by members of the medical professions. Five persons indicated that they would select agricultural or chemical engineering, two veterinary medicine and two said that they would prefer farming. One stated that he would prefer guitar playing and singing "Hound Dog."

The steadfastness and loyalty of entomologists are attested to by the many years of service rendered by members of our Branch and especially by the length of time they have held their present jobs. One member began his entomological career 44 years ago and he took his present job 39 years ago. Another notable record is that of a teacher who took his first entomological position 43 years ago and is still employed by the same institution. A member engaged in pest control established his own business 34 years ago. His first entomological job began 45 years ago. At least a dozen others have held their present positions for over 30 years. The average length of service for all those reporting is 17.3 years and the average duration of presently held positions is 10.4 years.

### Entomological Opportunities and Problems

The third part of the questionnaire related to ideas and opinions rather than specific facts. Members were asked to give their opinions concerning opportunities for entomologists in the Cotton States Branch area. They were also requested to list what they consider the two or three more critical entomological problems of today, and finally, where we should place more emphasis during the next five to ten years.

As the questionnaire showed so conclusively that members of the Branch are well pleased with their work, one might expect that they consider opportunities for entomologists to be good in our area. The returns confirm that opinion. Of the 213 persons who checked this item, 76 indicated that they regard opportunities here as excellent and 100 others think that they are good. A small minority of 28 feel that opportunities are just fair and only nine consider them definitely poor. Most of those in the last group made additional comments and these indicate that they referred to poor remuneration rather than to a lack of opportunity for research or other entomological work. One person expressed the opinion that entomological opportunities are very good, even in comparison with the physical sciences.

The question, "What field or specialty in entomology would you recommend to a college student who plans to become an entomologist?", brought almost as many answers as questionnaires returned. However, it is the general consensus that the aptitude and inclination of the student should be the primary consideration. Numerous others observed that the student should be well grounded in such basic courses as general zoology, physiology, ecology, chemistry, mathematics and English.

The request for opinions on the more critical problems confronting entomologists today, produced a wide variety of comments, as was expected. But on the other hand the replies show a striking similarity of thought with respect to several matters. The problem of insect "resistance" to insecticides led the list by a wide margin. It was mentioned by 90 members, and many of these made additional comments indicating concern with the nature and mechanism of resistance and the interrelationship of toxicology and physiology.

The need for more basic, fundamental information on insects was listed as a critical problem by 66 members. The fields or studies most frequently mentioned in this connection are insect physiology, general biology of insects with emphasis on crop pests and the ecological relationships of harmful insects. Several mentioned the need for more information on the morphology and taxonomy of insects and others listed the need for more realistic methods of evaluating damage caused by insects.

The problem of insecticide hazards was considered important by 33 members. Their comments referred most frequently to the toxicity and residue aspects of the problem. Frequent mention was made of the danger to human beings and domestic animals, and many are concerned with the possible ill effects of insecticides on wild life and other beneficial animals. The matter of pesticide residues causes anxiety to many members. They are thinking not so much about actual residues on fruits, vegetables and other food crops as about the more obscure aspects of the problem. For example, several wonder about the long range effects of insecticide residues accumulating in the soil and the influence of continued, wide application of insecticides on the "balance of nature."

Some 20 members feel that our lack of basic, fundamental information on insecticides is a matter for concern. About half of them think we spend too much time testing insecticides from the standpoint of their ability to kill with too little attention to their effects on plants and other living organisms. Several others referred to the need for more information on the mode of action of insecticides and the possible bearing this may have on the problem of "resistance."

Another large portion of the comments on problems can be grouped together under the general heading of public relations. At least 40 questionnaires referred to the failure of the general public to recognize the value of entomology and the lack of appreciation of the services rendered by entomologists. One member commented that "There are many otherwise well informed and influential citizens who have no idea what an economic insect pest may be or if there is such a thing anyway." One of our members feels that "Entomology has been dragging its feet and failing to sell the profession to the public . . . seem half ashamed of the science, in our failure to acquaint the public with the tremendous importance of the economics of entomology." Some half dozen members question that administrators always are sufficiently appreciative of entomologists and they believe that a fuller understanding of our needs might result in better facilities and more funds for entomological work.

Closely related to this last item is the matter of salaries paid entomologists. These were mentioned in 28 questionnaires. Most members who made such comments feel that entomologists are poorly paid in comparison with workers in other fields of science. Several others expressed the opinion that salaries paid entomologists are not commensurate with educational and experience requirements. A few commented on the spread between salaries paid entomologists in commercial work and those employed by the states or the Federal government.

Members of the branch are somewhat disturbed by the shortage of entomologists and the lack of trained personnel to fill new jobs that become available and to serve as replacements when old positions become vacant. This problem was mentioned in 29 questionnaires. Some believe that the situation may be due in part to our schools failing to offer students proper inducements to enter entomological training. Others feel that the causes are more far reaching. One wrote, "The present 'cry' in this country is that we need more trained scientists and engineers. This 'cry' more specifically relates to physical and chemical sciences than to agriculture or medicine. The decrease in the number of entomology under-graduates, and eventually graduates, is becoming more apparent. But when the physical sciences offer more remuneration for a specific type of employment, why should they (students) go into fields that pay so much less?" This same person thinks that money alone is not the sole consideration. In this connection he says "Witness the derision often associated with the 'aggie student' whether or not he is to be professionally qualified in the future. What we need perhaps, is an elevation of the whole field of agriculture and of entomology especially."

The last item of the questionnaire looks to the future by asking, "What phase of entomology should we emphasize during the next 5-10 years?" One might expect that the comments here would closely parallel those made in connection with the problems just discussed. However, that is not the case. "Resistance," and a need for more emphasis on basic fundamentals again lead the list but their positions are reversed. Whereas 90 persons mentioned the problem of "resistance," only 19 stated that it should receive special attention in plans for future work. On the other hand there were 66 references to lack of basic information as a problem while 80 persons recommend that we place particular stress on fundamentals in planning future work. Physiology, morphology, taxonomy and ecology of insects were the fields most often mentioned. Several listed chemistry, physics, statistics and genetics. Fifteen members advocate that we strive to improve public relations. Numerous other suggestions were made but usually these were mentioned by only one or two persons.

### Summary

This report shows that the Cotton States Branch is composed of active, alert scientists who are very much interested in their work and the entomological profession. They are aware of the many problems confronting us and are constantly seeking solutions for them. The great majority of the members are well pleased with their work and they feel that the Cotton States Branch area offers excellent opportunities for entomologists. Insect "resistance" to insecticides and the lack of basic information on insects and their control are considered the two most critical problems demanding attention. There is a rather general feeling that remuneration to entomologists is not in keeping with the educational and experience requirements demanded of them. There also is a belief that a better understanding, by the general public, of the services rendered by entomologists would result in greater appreciation of our profession.

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## A. W. LINDQUIST

### President of the A.M.C.A.

The American Mosquito Control Association met on April 28-May 2, 1957 at Miami Beach, Florida, and elected as their new President, A. W. Lindquist of the Entomology Research Division, U. S. Department of Agriculture.

Dr. Lindquist, who joined the former American Association of Economic Entomologists in 1936, is head of the Entomology Research Division's Section of Insects Affecting Man and Animals at Beltsville, Maryland. We are always pleased to note the achievements of our members and herewith extend congratulations.

The American Mosquito Control Association is an organization allied in certain aims with the Entomological Society of America. The two groups have many members in common, and both work for the advancement of entomology.

## ENTOMOLOGY RESEARCH DIVISION

### U. S. Department of Agriculture

Reorganization, perhaps another word is now in use, has continued in the U.S.D.A. The old Bureau of Entomology (later Bureau of Entomology and Plant Quarantine and recently Entomology Research Branch) is now the Entomology Research Division. Dr. E. F. Knipling is now designated as Director and Dr. C. H. Hoffmann as Assistant Director. Their official addresses are Entomology Research Division, Agricultural Research Service, USDA, Plant Industry Station, Beltsville, Maryland.

As of June, 1957, a number of changes in the organization of the Entomology Research Division are underway, but are incomplete at press time. These are in connection with the present Sections (formerly called Divisions) of the Division. A complete story on entomological work in the U. S. Department of Agriculture is planned for the September BULLETIN.

## REVISION OF THE CONSTITUTION

### NOTICE TO MEMBERS

The currently proposed revision of the Constitution of the Society was presented in full in the March 1957 issue of the BULLETIN for your careful study. The committee responsible for developing the framework has been dissolved by the Governing Board with an unanimous vote of commendation for a job well done. In conformity with the provisions of the present constitution it is now in your hands for any other suggested changes *germane* to its purpose and intent which is to assure that it is acceptable to both the academic and to the economic entomologists now making up the Society membership.

As you will have noted, the basic change introduces two major Divisions—Basic and Applied—each having three representatives on the Governing Board, replacing the former Sections in that respect. Sections are retained only for programming purposes and are increased in number from six to twelve to more adequately meet subject needs.

Another important change concerns the manner of selecting nominees for the office of President-Elect, by which a slate of three names, selected by the Governing Board, will be presented to the membership in a mail ballot for the election of one on the basis of a plurality vote. Since the Governing Board is made up of representatives of the Branches of the Society, and of the Sections through the new Divisions, the proposed procedure does not materially change that presently followed. However, it will permit the selection to be made through group discussion rather than independently, with proper consideration of geographic and subject interests on a rotating basis eliminating much of the confusion that has unavoidably developed under the present system.

All other changes so far proposed are more or less academic and of minor importance. However, they will provide for a smoother administration of the Society's rapidly increasing business.

This attempt represents the second complete revision of the Constitution resulting from amalgamation of the two former societies, the first having proved inadequate in meeting the needs of the larger and more complex organization. It is hoped that as finally adopted, it will serve for a number of years. However, such a result is dependent on the extent to which you, as members, express your thinking.

As further provided in the present Constitution, a special committee has been appointed to receive and clear your suggestions. The members are John T. Creighton, Chairman, University of Florida, Gainesville, Florida; Wm. E. Stone, USDA, Mexico City, Mexico and Daniel Ludwig, Fordham University, New York, New York. Suggestions should be directed to Dr. Creighton as early in the year as possible to permit careful study and consideration in the preparation of the final draft for presentation at the first business session of the annual meeting of the Society in Memphis in December. Further suggestions will be permitted at that time, but it is hoped that by this arrangement last minute suggestion can be avoided, and the completed draft approved for early submission to the total membership for their vote by mail ballot.

Absence of any suggestions can only be assumed as indicating that the revision as now drawn meets with your full approval.

H. M. ARMITAGE,
President.

## HOWARD CENTENNIAL

### 1857-1957

Leland Ossian Howard was born June 11, 1857 at Rockford, Illinois. On June 11, 1957 some 155 guests, including former co-workers of Dr. Howard in the U. S. Department of Agriculture, entomologists and other Howard admirers and their wives, met for a Centennial Dinner at the Cosmos Club in Washington, D. C. Guests of honor were daughters Misses Lucy and Janet Howard and grandson Howard Payne.

The dinner was sponsored by the Entomological Society of Washington, Dr. F. L. Campbell, of the National Research Council, President, and the Insecticide Society of Washington, Dr. Elizabeth E. Haviland, of the University of Maryland, President. The Centennial Dinner Organizing Committee consisted of W. G. Bruce, Paul Hubanks, Helen Sollers, all of the U.S. Department of Agriculture, J. S. Wade, U. S. Department of Agriculture, retired, and M. D. Leonard of the Shell Chemical Company. Dr. Leonard also acted as the very capable master of ceremonies. Brief reminiscent remarks were made by L. J. Briggs, Bureau of Standards, retired, John E. Graf, of the Smithsonian Institution, R. C. Roark and T. E. Snyder, both of the U. S. Department of Agriculture, retired. Dr. F. C. Bishopp, U.S. Department of Agriculture, retired, presented the well-received address of the evening. This address will be published in a later number of the BULLETIN.

Dr. Howard died May 1, 1950, when he was nearly 93. An obituary will be found in the JOURNAL OF ECONOMIC ENTOMOLOGY, 43(6):958-962, December, 1950. Some of the highlights of his career may be of interest.

Dr. Howard, who was Chief of the Bureau of Entomology, U.S. Department of Agriculture for nearly a quarter of a century, did more to promote entomology in the United States than any other single person. His basic work in this field helped make possible the great campaigns of today aimed at the total eradication of malaria throughout the world and the eradication or control of yellow fever and many other insect-borne diseases.

Dr. Howard's pioneering work in the control of insect pests in agriculture was also outstanding. This included his importation of parasites, natural enemies of agricultural insect pests.

A world authority in medical entomology, Dr. Howard was the first in the United States to report on the use of kerosene to kill mosquito larvae. His experiments led to the universal use of petroleum oils as mosquito larvicides, a vital factor in ridding the Panama Canal Zone of malaria, making possible the construction of the Panama Canal.

One of his books on mosquitoes contained the information that malaria and yellow fever are mosquito-borne diseases. It was published in 1901 when yellow fever was ravaging Havana and Panama. His recommendations were put into immediate and effective use to help rid both areas of the disease.

Dr. Howard was a man of great versatility and breadth of interest. His contributions were in many fields of entomology and he received numerous medals and awards not only in the United States but also in a number of foreign countries. Dr. Howard was the author of over 900 articles and a number of authoritative books. He attended a great number of international meetings and his scientific travels took him to England, France, Spain, Portugal, Belgium, Holland, Italy, Austria, Poland, Russia and Turkey, and he was a member of practically every entomological society in the world.